Section 2

Disaster Preparedness & Prevention

What to Do BEFORE A Disaster Strikes (Mitigation Tips)…

There are many things you can do to protect yourself, your home and your property BEFORE any type of natural hazard or disaster strikes. One of the most important things citizens can do is learn about hazards and risks in your area and take personal responsibility to prepare for the unexpected.

Please realize that natural disasters have common elements that overlap (like wind and floods) and we are only summarizing some key topics here to help get you started.

There are many mitigation tips and programs available from government agencies, public and private businesses, nonprofits and NGOs listed here and in **Section 4** of this book that can help you and your family learn more.

What is Mitigation?

Mitigation simply means an effort to lessen the impact disasters have on people, property, communities and the economy. It is also about reducing or eliminating risks before disasters strike and involves planning, commitment, preparation and communication between local, state and federal government officials, businesses and the general public.

Some examples of mitigation include installing hurricane straps to secure a structure's roof to its walls and foundation, building outside of flood plains, securing shelves and loose objects inside and around the home, developing and enforcing effective building codes and standards, using fire-retardant materials ... and the list goes on and on.

Soon we will explain what to do BEFORE, DURING and AFTER specific types of natural and man-made disasters and emergencies. But first there are some things you should do in advance that take time and planning... otherwise known as prevention or mitigation tips.

First we'll cover some mitigation strategies available for businesses and consumers, then cover mitigation tips on the two most common disasters (**winds** and **floods**) followed by other topics listed alphabetically. Also please review the BEFORE sections on common disasters that occur in your area since there may be a few other mitigation tips there too.

Remember... the more you prepare BEFORE disaster strikes, the better off you and your loved ones will be financially, emotionally and physically!

Mitigation Strategies for Businesses & Consumers

Both the United States and Canada have national programs designed to help the public, businesses and communities prepare for the unexpected.

In the U.S., the Federal Emergency Management Agency (FEMA) merged the Federal Insurance Administration and the Mitigation Directorate to create the Federal Insurance and Mitigation Administration (FIMA). FIMA combines organizational activities to promote Protection, Prevention, and Partnerships at the Federal, State, Local and individual levels to lessen the impact of disasters upon families, homes, communities and economy through damage prevention and flood insurance.

FIMA is made up of a number of programs and activities like the National Flood Insurance Program, National Hurricane, National Dam Safety, and National Earthquake Hazards Reduction Programs, and others involving Mitigation. For example, Mitigation Grant Programs provide funding for State and Local governments to reduce the loss of lives and property on future disasters, and Mitigation Planning offers resources to determine risks and hazards in communities. Plus FIMA provides citizens information about "safe rooms" and flood insurance, and small businesses can learn about Pre-Disaster Mitigation (PDM) loans and other cost-saving mitigation tips for structures and property.

To learn more please visit FIMA online at www.fema.gov/fima

In Canada, the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIPEP) is working with federal departments and agencies to determine how the Government of Canada can support the development of a National Disaster Mitigation Strategy and the co-operative arrangements that are needed for its implementation. Consultations with provincial / territorial governments, non-governmental organizations, and the private sector were held throughout 2002 with results to be summarized into a proposed NDMS framework for further consideration in 2003.

To learn more please visit OCIPEP online at www.ocipep.gc.ca

MITIGATION TIPS TO HELP PREVENT DAMAGE AND LOSS:

WIND MITIGATION *(MOST COMMON)*

Wind damage is the most common disaster-related expense and usually accounts for about 70% or more of the insured losses reported worldwide. Many natural disasters like hurricanes, tornadoes, microbursts or thunderstorms, and winter storms include damaging winds. And certain parts of the world experience high winds on a normal basis due to wind patterns.

Realize when extreme winds strike they are not constant - they rapidly increase and decrease. A home in the path of wind causes the wind to change direction. This change in wind direction increases pressure on parts of the house creating stress which causes the connections between building components to fail. For example, the roof or siding can be pulled off or the windows can be pushed in.

Strengthen weak spots on home

Experts believe there are four areas of your home that should be checked for weakness -- the roof, windows, doors and garage doors. Homeowners can take some steps to secure and strengthen these areas but some things should be done by an experienced builder or contractor.

ROOF:

- Truss bracing or gable end bracing (supports placed strategically to strengthen the roof)
- Anchors, clips and straps can be installed (may want to call a professional since sometimes difficult to install)

WINDOWS and DOORS:

- Storm shutters (available for windows, French doors, sliding glass doors, and skylights) or keep plywood on hand
- Reinforced bolt kits for doors

GARAGE DOORS:

- Certain parts of the country have building codes requiring garage doors to withstand high winds (check with local building officials)
- Some garage doors can be strenthened with retrofit kits (involves installing horizontal bracing onto each panel)

Secure mobile homes

Make sure your trailer or mobile home is securely anchored. Consult the manufacturer for information on secure tiedown systems.

Secure or tie down loose stuff

Extreme winds can also cause damage from flying debris that can act like missiles and ram through walls, windows or the roof if the wind speeds are high enough. You should consider securing large or heavy equipment inside and out to reduce some of the flying debris like patio furniture, barbeque grills, water heaters, garbage cans, bookcases and shelving, etc.

Consider building a shelter or "safe room"

Shelters or "safe rooms" are designed to provide protection from the high winds expected during hurricanes, tornadoes and from flying debris. Shelters built below ground provide the best protection, but be aware they could be flooded during heavy rains.

FEMA provides an excellent free booklet called "Taking Shelter From the Storm: Building a Safe Room Inside Your House" developed in association with the Wind Engineering Research Center at Texas Tech University.

Learn more about safe rooms by visiting www.fema.gov/mit/saferoom

FLOOD MITIGATION *(2ND MOST COMMON)*

Flood damage is normally the second most common disaster-related expense of insured losses reported worldwide. Many natural disasters like hurricanes, tornadoes, rain, thunderstorms, and melting snow and ice cause flooding.

There are certain parts of North America known as "flood plains" that are at high risk of floods. You may want to contact your local emergency management official to develop a community-based approach and there may even be funds available to assist you and your area.

Some examples of State grant programs officials can access include the Hazard Mitigation Grant Program (**HMGP**), Flood Mitigation Assistance (**FMA**) Program, and the Pre-Disaster Mitigation (**PDM**) Program. Individual citizens cannot apply for grant money but local agencies or non-profit organizations may apply on behalf of citizens.

But I have insurance...

Insurance companies will cover some claims due to water damage like a broken water main or a washing machine that goes berserk. However, standard home insurance policies DO NOT generally cover flood damage caused by natural events or disasters!

The United States offers a **National Flood Insurance Program** available in most communities and there is a waiting period for coverage. Talk to your local insurance agent, check the Yellow Pages directory, or call NFIP at 1-888-FLOOD29 or TDD# 1-800-427-5593 to help you find a local agent.

Currently Canadians do not have a national flood program, however, there are certain parts of Canada that offer limited flood-damage coverage but it must be purchased year-round and the rates are relatively high. The Insurance Bureau of Canada suggests you consult your insurance representative with questions regarding coverage.

Move valuables to higher ground

If your home or business is prone to flooding, you should move valuables and appliances out of the basement or ground level floors.

Elevate breakers, fuse box and meters

Consider phoning a professional to elevate the main breaker or fuse box and utility meters above the anticipated flood level so flood waters won't damage your utilities. Also consider putting heating, ventilation and air conditioning units in the upper story or attic to protect from flooding.

Protect your property

Build barriers and landscape around homes or buildings to stop or reduce floodwaters and mud from entering *(see pages 45-46)*. Also consider sealing basement walls with waterproofing compounds and installing "check valves" in sewer traps to prevent flood water from backing up into your drains.

The next few pages cover some key mitigation tips on several types of disasters and topics (sorted alphabetically). After this mitigation section we will then cover specific natural and man-made disasters in more detail.

AIR QUALITY MITIGATION

We want to briefly mention indoor air quality here since it affects so many people at home, school and work (especially children and the elderly). Poor air quality often results naturally from many environmental and weather-related factors. There are things people can do and kits available for testing home, work and school environments so please learn more about carbon monoxide, mold, and radon by visiting or calling the following groups ...

EPA's Indoor Air Quality: www.epa.gov/iaq or call 1-800-438-4318

Center for Disease Control's National Center for Environmental Health Air Pollution & Repiratory Health: www.cdc.gov/nceh/airpollution

National Radon Info Line: 1-800-SOS-Radon (1-800-767-7236)

EARTHQUAKE MITIGATION

A lot of the ongoing research by scientists, engineers and emergency preparedness officials has resulted in improvements to building codes around the world. Proven design and construction techniques are available that help limit damage and injuries.

There are some things you can do to reduce risk in an earthquake-prone area:

Consider retrofitting your home

There are options to retrofit or reinforce your home's foundation and frame available from reputable contractors who follow strict building codes.

Other earthquake-safety measures include installing flexible gas lines and automatic gas shutoff valves. Changes to gas lines and plumbing in your house must be done by a licensed contractor who will ensure that the work is done correctly and according to code. This is important for your safety.

Secure loose stuff

- Use nylon straps or L-braces to secure cabinets, bookcases and other tall furniture to the wall.
- Secure heavy appliances like water heaters, refrigerators, etc. using bands of perforated steel (also known as "plumber's tape").
- Use buckles or safety straps to secure computers, televisions, stereos and other equipment to tabletops.
- Use earthquake or florist putty to tack down glassware, heir-looms and figurines.

FIRE MITIGATION

Home fire protection is very important and covered on pages 55-56. Also see Wildfire Mitigation below to learn additional ways to protect your home.

LIGHTNING MITIGATION

Here are some safety tips to prepare your home for lightning.

Install a Lightning Protection System

A lightning protection system does not prevent lightning from striking but does create a direct path for lightning to follow. Basically, a lightning protection system consists of air terminals (lightning rods) and associated fittings connected by heavy cables to grounding equipment. This provides a path for lightning current to travel safely to the ground.

Install surge protectors on or in home

Surge protection devices (SPDs) can be installed in the electrical panel to protect your entire home from electrical surges. Sometimes it may be necessary to install small individual SPDs in addition to the home unit for computers and television sets due to different ratings and voltage levels.

If a home unit is too expensive, consider getting individual surge protection devices that plug into the wall for the refrigerator, microwave and garage door openers. Appliances that use two services (cable wire and electrical cord) may require combination SPDs for computers, TVs, and VCRs.

WILDFIRE MITIGATION

As our population continues to grow, more and more people are building homes in places that were once pristine wilderness areas. Homeowners who build in remote and wooded areas must take responsibility for the way their buildings are constructed and the way they landscape around them.

Use Fire Resistant Building Materials

The roof and exterior structure of your home and other buildings should be constructed of non-combustible or fire-resistant materials. If wood siding, cedar shakes or any other highly combustible materials are used, they should be treated with fire retardant chemicals.

Landscape wisely

Plant fire-resistant shrubs and trees to minimize the spread of fire and space your landscaping so fire is not carried to your home or other surrounding vegetation. Remove vines from the walls of your home.

Create a “safety zone” around the house

- Mow grass regularly.

- Stack firewood at least 100 feet (30 m) away and uphill from home.
- Keep your roof and gutters free of pine needles, leaves, and branches and clear away flammable vegetation at least 30 to 100 feet (9 to 30 m) from around your structures.
- Thin a 15-foot (4.5 m) space between tree crowns and remove limbs within 10-15 feet (3 - 4.5 m) of the ground.
- Remove dead branches that extend over the roof.
- Prune tree branches and shrubs within 10 feet (3 m) of a stovepipe or chimney outlet.
- Remove leaves and rubbish from under structures.
- Ask the power company to clear branches from power lines.
- Keep combustibles away from structures and clear a 10-foot (3 m) area around propane tanks, barbeques, boats, etc.

Protect your home

- Install smoke detectors, test them each month and change batteries once a year.
- Consider installing protective shutters or fire-resistant drapes.
- Inspect chimneys at least twice a year and clean every year.
- Cover chimney and stovepipe flue openings with 1/2 inch (1 cm) or smaller non-flammable mesh screen.
- Use this same mesh screen beneath porches, decks, floor areas and the home itself. Also screen openings to attic and roof.
- Soak ashes and charcoal briquettes in water for two days in a metal bucket.
- Keep a garden hose connected to an outlet.
- Have fire tools handy (ladder, shovel, rake, saw, ax, bucket, etc.)
- Address should be visible on all structures and seen from road.

WINTER STORM & EXTREME COLD MITIGATION

Severe winter weather causes deterioration and damage to homes every year. There are many things you can do to prepare for the bitter cold, ice and snow in advance to save you money and headaches in the long run. Some of these tips should be used by apartment dwellers too!

"Winterize" your home

- Insulate walls and attic.
- Caulk and weather-strip doors and windows to keep cold out.
- Install storm windows or cover windows with plastic film from the inside to keep warmth in.
- Detach garden hoses and shut-off water supply to those faucets.

- Install faucet covers or wrap tightly with towels and duct tape.
- Show family members the location of your main water valve and mark it so you can find it quickly.
- Drain sprinkler water lines or well lines before the first freeze.
- Keep the inside temperature of your home at 68 degrees Fahrenheit (20 degrees Celsius) or higher, even if leaving.
- Wrap pipes near exterior walls with heating tape or towels.
- Change furnace filters regularly and have it serviced from time to time.
- Make sure you have good lighting from street and driveways to help others see snow and ice patches and try to keep paths clear of drifts.
- Remove dead tree branches since they break easily.
- Cover fireplace / stovepipe openings with fire-resistant screens.
- Check shingles to make sure they are in good shape.

Preventing "ice dams"

A lot of water leakage and damage around outside walls and ceilings are actually due to "ice dams". Ice dams are lumps of ice that form on gutters or downspouts and prevent melting snow from running down. An attic with no insulation (like a detached garage) or a well-sealed and insulated attic will generally not have ice dams. But if the roof has many peaks and valleys, is poorly insulated, or has a large roof overhang, ice dams usually happen.

Some tips to prevent ice dams:

- Keep gutters and downspouts clear of leaves and debris.
- Find areas of heat loss in attic and insulate it properly.
- Wrap or insulate heating duct work to reduce heat loss.
- Remove snow buildup on roof and gutters using snow rake or soft broom.
- Consider installing roof heat tapes (electric cables) that clip onto the edge of your shingles to melt channels in the ice. (Just remember - cables use a lot of energy and may not be pretty but could help on older homes with complicated roofs).

Preventing frozen pipes

- Keep cabinet doors open under sinks so heat can circulate.
- Run a slow trickle of lukewarm water and check water flow before going to bed and when you get up. (The first sign of freezing is reduced water flow so keep an eye on it!)
- Heat your basement or at least insulate it well!
- Close windows and keep drafts away from pipes since air flow can cause pipes to freeze more often.

MITIGATION TIPS SUMMARY...

Take responsibility...

Basically, no matter where you live, you should take personal responsibility and prepare yourself, your family and your property BEFORE disasters or natural hazards strike.

...and learn more!

After reviewing the remainder of this manual, please contact your local emergency officials or your local building department to learn about all the risks in your area and what to expect if disaster strikes.

Remember, the best thing you can do to deal with ANY type of disaster is…

BE AWARE… **BE PREPARED**… and… **HAVE A PLAN**!

If you do these 3 things, the life and property you save could be your own… because what you don't know CAN hurt you!

What to Expect When ANY Type of Disaster Strikes…

Local government and disaster-relief organizations will try to help you but there are many times they cannot reach you immediately after a disaster.

You should be ready to be self-sufficient for at *least* three days… possibly longer depending on the type of disaster!

This may mean providing for your own shelter, food, water and sanitation. If you have planned ahead, it will be easier to recover from a disaster as long as you have a **Family Emergency Plan** and a **Disaster Supplies Kit** for you and your family. This can help reduce some of the fear, anxiety and losses that surround a disaster.

By planning ahead, you will know where to go, be ready to evacuate if necessary, and be a little more comfortable in a shelter by having some of your own personal items with you in your **Disaster Supplies Kit**.

Now we are going to explain what to do **BEFORE**, **DURING** and **AFTER** specific types of natural and man-made disasters (sorted alphabetically).

Then we'll cover some tips on **RECOVERING FROM A DISASTER** (includes many "AFTER" tips that apply to most every type of disaster) and on **SHELTER LIVING**.

We then offer some tips on **USING HOUSEHOLD FOODS**, **WATER PURIFICATION**, and **SANITATION OF HUMAN WASTE** followed by tips for **HELPING OTHERS** at the end this Section.

Section 3 covers a variety of basic First Aid topics that may be necessary to use during a major disaster, emergency or just for the minor injury at home.

Section 4 contains many helpful telephone numbers of organizations in America and Canada. And finally, we ask you please take some time to review the topics, resources and web sites near the back of this manual.

As we mentioned in the Introduction, a majority of this information was compiled from various publications provided by the American and Canadian Red Cross, U.S.'s Department of Homeland Security and FEMA, Canada's OCIPEP and others to help assist you in preparing for various types disasters.

We realize you may not experience every type of disaster or emergency in your part of the world but, if you ever travel away from home, you could potentially be placed in a disaster situation so please educate yourself and your family. Knowledge is power and can help reduce fear and anxiety.

What are YOU gonna do about…

What are YOU gonna do about…
AVALANCHES, LANDSLIDES & MUDFLOWS?

Avalanches - masses of loosened snow or ice that tumble down the side of a mountain, often growing as it descends picking up mud, rocks, trees and debris triggered by various means including wind, rapid warming, snow conditions and humans.

Landslides - masses of rock, earth or debris that move down a slope and can be caused by earthquakes, volcanic eruptions, and by humans who develop on land that is unstable.

Mudflows - rivers of rock, earth, and other debris soaked with water mostly caused by melting snow or heavy rains and create a "slurry". A "slurry" can travel several miles from its source and grows in size as it picks up trees, cars, and other things along the way just like an avalanche!

Please realize data on avalanches fill up entire books and we are briefly touching on some basic information here with some references to obtain more information, then we'll cover landslides and mudflows.

Avalanche Basics

Snow avalanches are a natural process and happen about a million times per year worldwide. Contrary to what is shown in the movies, avalanches are not triggered by loud noises like a shout or a sonic boom -- it's just not enough force. An avalanche is actually formed by a combination of several things -- a steep slope (the terrain), the snowpack, a weak layer in the snowpack, and a natural or artificial "trigger".

Nearly all avalanches that involve people are triggered by the victim or a member of their party. Each year avalanches claim between 100-200 lives around the world and thousands of people are partly buried or injured in them.

Millions of skiers, hikers, climbers, boarders, and snowmobilers venture out to enjoy winter sports each year pushing towns, roads and activities into avalanche-prone areas. Compound that with recreationists who cross into the backcountry with little or no basic avalanche training... and you've got a recipe for potential disaster!

Types of avalanches

Slab - the most dangerous type of avalanche since it causes most fatalities. Experts compare slab avalanches to a dinner plate sliding off the table - a heavier plate of snow slides on top of weaker snow down a slope. An average-sized dry slab avalanche travels about 80 mph (128 km/h) and it's nearly impossible to outrun it or get out of the way!

Most avalanche deaths are caused by slab even though there are many obvious signs that indicate danger -- so educate yourself before venturing out into the backcountry!

Powder or loose snow - fresh fallen, light, dry snow (similar to fine sugar) rolls downhill with speeds of 110-180 mph (180-290 km/h) and swirls of powder climbing several thousand feet into the air. This is the most common type of avalanche and the danger is usually not the weight or volume but rather victims being pushed over a cliff or into a tree.

Some other types of avalanches include ice falls, wet and point release.

You can find more information on the Internet at the North American Avalanche Centers' web site www.avalanche.org or visit your local library.

Typical Avalanche Victims

Nearly everyone caught in an avalanche is either skiing, snowboarding, riding a snowmobile, snowshoeing, hiking or climbing in the backcountry and they, or someone in their party, almost always trigger the avalanche that injures or kills them. According to the American Avalanche Association, the majority of victims are white, educated men between the ages of 18-35 who are very skilled at their sport.

One key is for the public to take personal responsibility and learn more about avalanche risks and safety procedures. The AAA has seen an increase in attendance now that avalanche educators are re-designing their courses to accommodate snowmobilers, snowboarders and other groups.

People should be prepared and learn how to recognize, assess and avoid avalanche danger by taking an avalanche-related course before entering the backcountry.

The "Avalanche Triangle"

The following was excerpted from the **U.S.D.A. Forest Service National Avalanche Center** at www.avalanche.org/~nac (see "Avalanche Basics"):

Avalanches are formed by a combination of 3 ingredients (sometimes called the "avalanche triangle")...

Terrain - the slope must be steeper than 25 degrees and most often occur on slopes between 35 and 45 degrees. Most slab avalanches occur on slopes with starting zone angles between about 30 and 45 degrees.

Snowpack - the snowpack accumulates layer by layer with each weather event and both strong and weak layers exist. Strong layers contain small round snow grains that are packed closely together and well bonded (or cohesive). Weak layers are less dense and appear loose or "sugary". When a strong dense layer is over a weak less dense layer it's like a brick on top of potato chips -- the chips can't hold up the weight of the brick so an avalanche

occurs. Backcountry recreationists must learn the relationship of these layers because weak layers prevent strong layers from bonding with one another thus causing unstable conditions.

A snowpack is balanced between stress and strength -- add additional stress (like more snow or a human) and an avalanche could be triggered.

Weather - precipitation, wind and temperature can alter the stability of the snowpack by changing the balance between stress and strength. The type of precipitation and at what rate it falls are equally as important as the amount. If a lot of snow falls in a short amount of time, the snowpack has less time to adjust to the additional stress. Wind can blow large amounts of snow around shifting the stress on the snowpack. And rapid warming temperatures can cause snowpacks to become very wet and unstable.

Before An Avalanche:

Learn risks - Ask about local risks by contacting your local emergency management office *(see Section 4 for State & Provincial listings),* especially if visiting or moving to an "avalanche-prone" area.

Take a course - Professional trainers and educators offer a variety of avalanche safety training courses and levels ranging from recreational novices to backcountry experts. To learn more visit www.avalanche.org and click on "Resources" then "Education".

Know your colors - Learn the Avalanche Danger Scales and corresponding colors used where you live or plan to visit.

Get equipped - Carry avalanche rescue equipment or gear like portable shovels, collapsible probes or ski-pole probes, high frequency avalanche beacons (transceivers), etc. and learn how to use it! Remember ... just having avalanche equipment will NOT keep you out of an avalanche!!

Check it out - Check forecasts and avalanche advisories before going out.

Turn it on - Switch beacon on prior to entering the backcountry! Check the battery strength and verify the "transmit" and "receive" functionality with everyone in your group to ensure beacons are picking up both signals.

Secure it - Before crossing a snow covered slope in avalanche terrain, fasten clothing securely to keep snow out and remove your ski pole straps.

During an Avalanche:

Bail - Try out get out of the way if possible! (For example, if you are a skier or boarder - ski out diagonally... if on a snowmobile - drive downhill, etc.)

If YOU are caught in the avalanche...

Scream and drop it - Yell and drop your ski poles (or anything in your hands) so they don't drag you down.

Start swimming - Use "swimming" motions, thrusting upward to try to stay near the surface of the snow.

Prepare to make an air pocket - Try to keep your arms and hands moving so the instant the avalanche stops you can make an air pocket in front of your face by punching in the snow around you before it sets.

If you see SOMEONE ELSE caught in the avalanche...

Watch - Keep an eye on victim as they are carried downhill, paying particular attention to the last point you saw them.

After an Avalanche:

If YOU are caught in the avalanche...

Make an air pocket ASAP! - The INSTANT the avalanche stops try to maintain an air pocket in front of your face by using your hands and arms to punch in the snow and make a pocket of air. (You only have 1-3 seconds before the snow sets -- and most deaths are due to suffocation!)

Stick it out - If you are lucky enough to be near the surface, try to stick out an arm or a leg so that rescuers can find you.

Don't panic - Keep your breathing steady to help preserve your air space and help your body conserve energy.

Listen for rescuers - Since snow is such a good insulator, rescuers probably won't even hear you until they are practically on top of you, so don't start yelling until you hear them. (This will conserve your precious air!)

If you see SOMEONE ELSE caught in the avalanche...

Watch - Keep watching the victim(s) as they are carried downhill, paying particular attention to the last point you saw them.

DO NOT go for help! - Sounds crazy but the victim only has a few minutes to breathe under the snow, so every second counts! Spend 30 minutes to an hour searching before going for help (unless you have a large party and someone can go while the rest search).

Be aware - Assess the situation and dangers... in many cases it is safe to go in after the avalanche settles but proceed with caution!

Look for clues - Start looking for any signs on the surface (like poles, a hand or foot, etc.) where victim was last seen. And remember, equipment and clothing can be ripped off during the avalanche but can help determine the direction they were carried.

Switch to "receive" - Turn all transceivers to "receive" to try to locate victim's signal (in the event victim is wearing one and has it set correctly!)

Mark the spot - If you lost sight of the victim or can't find any visible clues on the surface, mark the spot where victim was last seen.

Probe in a line - When searching with probes, stand shoulder to shoulder in a line across the slope and repeatedly insert probes moving down the slope.

Listen - Make sure you listen for any muffled sounds as you search.

Find them...dig 'em out! - If you find the victim, dig them out as quickly as possible! Survival chances reduce the longer they are buried.

To learn more about avalanches visit the North American Avalanche Centers' web site at www.avalanche.org. Or see our ADDITIONAL RESOURCES & WEB SITES listed at the end of this book.

Now we will briefly cover **landslides** and **mudflows**. Realize many types of disasters like earthquakes, volcanic eruptions, rain and wind erosion can cause land, rocks and mud to shift and move, sometimes at rapid speeds. Compound that with gravity and these earth movements can become extremely destructive.

Another major factor is the world's growing population is sprawling out of major cities and developing in high-risk areas. There are some warning signs to indicate if you have a potential problem.

Before A Landslide or Mudflow:

Learn risks - Ask your local emergency management office *(see Section 4 for State & Provincial listing)* if your property is a "landslide-prone" area. Or contact your County/Municipal or State/Provincial Geologist or Engineer.

Get insurance...? - Talk to your agent and find out more about the **National Flood Insurance Program** since mudflows are covered by NFIP's flood policy. *(see FLOOD MITIGATION at beginning of this Section)*

Be prepared to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

Reduce risks - Plant ground cover on slopes and build retaining walls.

Inspect - Look around home and property for landslide warning signs:

- cracks appear on hill slopes, ground or paved roads
- water or saturated ground in areas not normally wet
- evidence of slow, downhill movement of rock and soil
- tilted trees, poles, decks, patios, fences or walls
- visible changes like sags and bumps at base of a slope
- doors and windows stick or cracks appear on walls, etc.

Call an expert...? - Consult a professional landscaping expert for opinions and advice on landslide problems.

During a Landslide or Mudflow:

Strange sounds - Listen for trees cracking, rocks banging together or water flowing rapidly (especially if near a stream or river) - could be close by!

Move it! - Whether you are in a vehicle, outside, or in your home – GET TO SAFER GROUND!

Be small - If there is no way to escape, curl into a tight ball and protect your head the best you can.

(Since most other disasters cause landslides and mudflows, we'll discuss them further in those specific cases - please see other topics to learn more.)

After a Landslide or Mudflow:

Listen - Local radio and TV reports will keep you posted on latest updates or check with your local police or fire departments.

Don't go there - Stay away from the area until authorities say all is clear since there could be more slides or flows.

Insurance - If your home suffers any damage, contact your insurance agent and keep all receipts for clean-up and repairs.

Things to watch for:

- **flooding** - usually occur after landslides or debris flows
- **damaged areas** - roadways and bridges may be buried, washed-out or weakened -- and water, gas & sewer lines may be broken
- **downed power lines** - report them to power company

Replant - Try to fix or replant damaged ground to reduce erosion.

What are YOU gonna do about…
An Earthquake?

Earthquakes can cause buildings and bridges to collapse, down telephone and power lines, and result in fires, explosions and landslides. Earthquakes can also cause huge ocean waves, called tsunamis, which travel long distances over water until they hit coastal areas.

Our planet's surface is actually made up of slowly-moving sections (called "tectonic plates") that can build up friction or stress in the crust as they creep around. An earthquake occurs when this built up stress is suddenly released and transmitted to the surface of the earth by earthquake waves (called seismic waves).

There are actually about one million small earthquakes, or seismic tremors, per year around the world. Many earthquakes are too small to be felt, but when they happen, you will feel shaking, quickly followed by a rolling motion that can rotate up, down, and sideways that lasts from a few seconds to several minutes!

Before an Earthquake:

Learn the buzzwords - Learn the terms / words used with earthquakes...

- **Earthquake** - a sudden slipping of the earth's crust that causes a series of vibrations
- **Aftershock** - usually not as strong as an earthquake but can occur for hours, days, months or years after the main quake
- **Fault** - area of weakness where two sections of crust have separated
- **Epicenter** - area of the earth's surface directly above the crust that caused the quake
- **Seismic Waves** - vibrations that travel from the center of the earthquake to the surface
- **Magnitude** - used to define how much energy was released (A Richter Scale is the device used to measure this energy on a scale from 0-10 ... each whole number equals an increase of about 30 times the energy released meaning a 5.0 is about 30 times stronger than a 4.0.)

Prepare - See EARTHQUAKE MITIGATION at beginning of this Section.

Reduce risks - Look for things that could be hazardous...

- Place large or heavy objects on lower shelves and fasten shelves to walls, if possible.

- Hang heavy pictures and mirrors away from beds.
- Store bottled foods, glass, china and other breakables on low shelves or in cabinets that can fasten shut.
- Repair any faulty electrical wiring and leaky gas connections.

Learn to shut off - Know where and how to shut off electricity, gas and water at main switches and valves -- ask local utilities for instructions.

Do drills - Hold earthquake drills with your family to learn what to do...

- SAFE SPOTS - under a sturdy table or against an inside wall
- DANGER ZONES - near windows or bookcases or furniture that can fall over

Make a plan - Review Section 1 and develop a **Family Emergency Plan.**

Check policies - Review your insurance policies. Some damage may be covered even without specific earthquake insurance.

During an Earthquake:

Stay calm and stay where you are! Most injuries happen when people are hit by falling objects when running IN or OUT of buildings.

IF INDOORS – Stay inside!

- Find a SAFE SPOT - under a heavy desk, bench or table or against an inside wall.
- Avoid DANGER ZONES - glass, windows, heavy things that can fall over or down on you.

IF OUTDOORS - Stay outside! Try to move away from buildings, power lines and street lights.

IF IN A CROWDED PUBLIC PLACE - Don't run for the door… a lot of other people will try to do that!

- Find a SAFE SPOT and avoid DANGER ZONES.
- Move away from display shelves containing objects that may fall.

IF IN A HIGH-RISE BUILDING – Stay on the same floor!

- Find a SAFE SPOT (under a desk or table).
- Move away from outside walls and windows.
- Stay in building on same floor - you may not have to evacuate.
- Realize the electricity may go out and alarms and sprinkler systems may go on.
- DO NOT use the elevators!

IF IN A MOVING VEHICLE - Stop as quickly and safely as you can!

- Stay in the vehicle.
- Try not to stop near or under buildings, trees, overpasses, or power lines.
- Watch for road and bridge damage and be ready for aftershocks once you drive again.

If you are trapped in an area:

- **light** - use a flashlight (if you have one) – don't use matches or lighters in case of gas leaks
- **be still** - try to stay still so you won't kick up dust
- **breathing** - cover your mouth with a piece of clothing
- **make noise** - tap on a pipe or wall so rescuers can hear you (shout only as a last resort since you could inhale a lot of dust)

After an Earthquake:

Aftershocks - Usually not as strong but can cause more damage to weakened structures. Can occur a few more times or go on for days, months or years!

Injuries - Check yourself and people around you for injuries - do not try to move seriously injured people unless they are in danger. If you must move a person who is passed out keep their head and neck still and call for help! *(See Section 3 – TIPS ON BASIC FIRST AID)*

Light - Never use candles, matches or lighters since there might be gas leaks. Use flashlights or battery powered lanterns.

Check home - Look for structural damage -- call a professional if necessary.

Check chimney - First check from a distance to see if chimney looks normal and have a professional check it if it looks strange!

Clean up - Any flammable liquids (bleaches, gasoline, etc.) should be cleaned up immediately.

Inspect - Check all utility lines and appliances for damage:

- **smell gas or hear hissing** - open a window and leave quickly. Shut off main valve outside, if possible, and call a professional to turn back on when it's safe
- **electrical damage** - switch off power at main fuse box or circuit breaker
- **water pipes** - shut off water supply at the main valve
- **toilets** - do not use until you know sewage lines are okay

Water - If water is cut off or contaminated then use water from your **Disaster Supplies Kit** or other water sources.

Phones - Keep calls to a minimum to report emergencies since most lines will be down.

Listen - Keep up on news reports for the latest information.

Things to avoid:

- **going out** - try to stay off the roads to reduce risk
- **watch out** - watch for fallen objects and bridge or road damage
- **stay away** - unless emergency crew, police or firemen ask for your help stay away from damaged areas
- **downed power wires**

Tsunami - If you live near the coast, a tsunami can crash into the shorelines so listen for warnings by local authorities. *(see section on TSUNAMIS)*

RED or GREEN sign in window – After a disaster, Volunteers and Emergency Service personnel will be going door-to-door to check on people. By placing a sign in your window that faces the street near the door, you can let them know if you need them to STOP HERE or MOVE ON.

Either use a piece of RED or GREEN construction paper or draw a big RED or GREEN "X" (using a crayon or marker) on a piece of paper and tape it in the window.

- RED means STOP HERE!
- GREEN means EVERYTHING IS OKAY…MOVE ON!
- Nothing in the window would also mean STOP HERE!

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about…
An Evacuation?

Evacuations are pretty common and happen for a number of reasons – fires, floods, hurricanes, or chemical spills on the roads or railways.

When community evacuations become necessary, local officials provide information to the public usually through the media. Government agencies, the Red Cross and other disaster relief organizations provide emergency shelter and supplies. But, as we have said before, you should have enough food, water, clothing and emergency supplies for at least 3 days - or longer in a catastrophic disaster - in case you cannot be reached by relief efforts.

The amount of time to evacuate obviously depends on the type of disaster. Hurricanes can be tracked and allow a day or two notice to get ready, but many types of disasters happen without much notice… so prepare NOW!!

Before an Evacuation:

Ask & learn - Ask local emergency management officials about community evacuation plans and learn the routes that should be used.

Make a plan - Review Section 1 and develop a **Family Emergency Plan** (so you know where to meet if separated, know what schools or day cares do with kids, have a **Disaster Supplies Kit** ready to go, etc.)

Fill 'er up - Keep car fueled up if evacuation seems likely since gas stations may close during emergencies.

Learn to shut off - Know where and how to shut off electricity, gas and water at main switches and valves -- ask local utilities for instructions (and keep a wrench handy).

Review tips on basic needs - Please review TIPS ON SHELTER LIVING, TIPS ON USING HOUSEHOLD FOODS, TIPS ON WATER PURIFICATION and TIPS ON SANITATION OF HUMAN WASTE near end of this section to prepare yourself and family for what to expect.

During an Evacuation:

Listen - Keep up on news reports for the latest information.

Grab & Go - Grab your **Disaster Supplies Kit** (has water, food, clothing, emergency supplies, insurance and financial records, etc. ready to go).

What do I wear? - Put on protective clothing (long sleeve shirt and pants) and sturdy shoes - may even want to grab a hat or cap.

Shut off utilities - Turn off main water valve and electricity (if authorities tell you to do so).

Secure home - Close and lock doors and windows, unplug appliances, protect water pipes (if freezing weather), tie down boats, etc. *(See specific types of disaster for additional tips on securing home)*

Alert family / friends - Let others know where you are going (or at least leave a message or note in clear view explaining where you can be found).

Things to avoid:

- **bad weather** - leave early enough so you are not trapped
- **shortcuts** - may be blocked -- stick to the recommended Evacuation routes
- **flooded areas** - roadways and bridges may be washed-out
- **downed power lines**

Review tips on basic needs - Make sure you review tips on SHELTER LIVING, USING HOUSEHOLD FOODS, WATER PURIFICATION and SANITATION OF HUMAN WASTE at end of this section to prepare your family for the unexpected.

What are YOU gonna do about… Extreme Heat?

What is Extreme Heat? Temperatures that hover 10 degrees or more above the average high temperature for that area and last for several weeks are considered "extreme heat" or a **heat wave**. Humid and muggy conditions can make these high temperatures even more unbearable. Really dry and hot conditions can cause dust storms and low visibility. **Droughts** occur when a long period passes without enough rainfall. A heat wave combined with a drought is a very dangerous situation!

Doing too much on a hot day, spending too much time in the sun or staying too long in an overheated place can cause **heat-related illnesses**. Know the symptoms of heat illnesses and be ready to give first aid treatment. *(see HEAT-RELATED ILLNESSES in Section 3)*

Before Extreme Heat Hits:

Keep it cool - Tips to keep hot air out and cool air inside include...

- Close any floor heat vents nearby.
- Insulate gaps around window unit (use foam, duct tape, etc.)
- Use a circulating or box fan to spread the cool air around.
- Use aluminum foil covered cardboard in windows to reflect heat back outside.
- Use weather-stripping on doors and windowsills.
- Keep storm windows up all year to help keep cool in.

During Extreme Heat:

Protect windows - If you hang shades, drapes, sheets, or awnings on windows you can reduce heat from entering home by as much as 80%.

Conserve power - During heat waves there are usually power shortages since everyone is trying to cool off, so stay indoors as much as possible.

Conserve water - Tips to lower water usage, esp. during drought conditions

- Check plumbing for leaks.
- Replace toilet and shower head with "low flow" versions.
- Don't leave water running while shaving, brushing teeth, washing dishes, cleaning fruit or veggies, etc.
- If washing a load of dishes or clothes, make sure it's a full load.

- Take short showers rather than filling up a bathtub.
- Limit watering lawn or washing cars -- wastes precious water.

No A/C..? - If you have no air conditioning, try to stay on the lowest floor out of the sunshine and use electric fans to help keep yourself cool.

Eat light - Light meals are best, especially fresh fruits and veggies.

Drink WATER - Increase your daily intake of water, esp. in dry climates (deserts and high elevations) -- you don't realize how dehydrated you get.

Limit booze - Even though beer and alcoholic beverages may be refreshing on a hot day, they actually cause your body to dehydrate more!

What to wear - Light-colored (to reflect heat) loose-fitting clothes are best… and cover as much skin as possible. Dark colors absorb the sun's heat. Also, wear a wide-brimmed hat to protect face and neck.

Use sunscreen - Apply lotion or cream at least 20 minutes before going outside so skin can absorb and protect, esp. face and neck (SPF 15-30 is best but an SPF 8 should be the lowest you go). You usually burn within the first 10 minutes outside, so take care of your skin… especially children!! A sunburn slows the body's ability to cool itself and can be extremely dangerous.

Working outdoors - If you have to do yard work or other outdoor work, try to do it in the early morning hours to limit exposure in the sun. The most powerful sun is between 10 a.m. and 3 p.m. (when you burn the quickest) so limit outdoor activity during the heat of the day, if possible.

Ozone alerts - These can cause *serious* danger to people with breathing and respiratory problems (especially children and the elderly) so limit your time outdoors when alerts are announced on the radio, newspapers or TV.

- **ozone** - a colorless gas that is in the air we breathe and is a major element of urban smog.
- **ground-level ozone** - considered an air pollutant and can lower resistance to colds, cause problems for people with heart & lung disease, and cause coughing or throat irritation
- **ozone levels** - (also called Air Quality Index) between 0-50 are fine, but anything above 100 is extremely dangerous! When the weather is hot and sunny with little or no wind it can reach unhealthy levels.

What are YOU gonna do about… Fires & Wildfires?

Since fire spreads so quickly, there is NO time to grab valuables or make a phone call! In just two minutes a fire can become life threatening! In five minutes a house can be engulfed in flames!

A fire's heat and smoke are more dangerous than the actual flames since you can burn your lungs by inhaling the super-hot air. Fire produces a poisonous gas that makes you drowsy and disoriented (confused). Instead of being awakened by a fire, you could fall into a deeper sleep!

We are going to cover two subjects here -- **FIRES** and **WILDFIRES**. First we will discuss FIRES like you might encounter in your home or apartment, then we will cover WILDFIRES since there are many things people need to think about when living near wilderness areas.

Before A Fire (Fire Safety Tips):

INSTALL SMOKE DETECTORS! If you already have smoke detectors, clean and check them once a month and replace batteries once a year!

Make a plan - Review Section 1 and create an Escape Plan that includes two escape routes from every room in the house and walk through the routes with your entire family. Also...

- Make sure windows are not nailed or painted shut.
- Make sure security bars on windows have a fire safety opening feature so they can be easily opened from the inside… and teach everyone how to open them!
- Teach everyone how to stay LOW to the floor (where air is safer) when escaping fire.
- Pick a spot outside to meet after escaping fire (meeting place).

Clean up - Keep storage areas clean - don't let newspapers & trash stack up.

Check power sources - Check electrical wiring and extension cords -- don't overload cords or outlets. Make sure there are no exposed wires anywhere and make sure wiring doesn't touch home insulation.

Use caution - Never use gasoline or similar liquids indoors and never smoke around flammable liquids!

Check heat sources - Check furnaces, stoves, cracked or rusty furnace parts, and chimneys. Always be careful with space heaters and keep them at least 3 feet (1 m) away from flammable materials.

Know how to shut off power - Know where the circuit breaker box and gas valve is and how to turn them off, if necessary. (And always have a gas company rep turn on a main gas line.)

Install & learn A-B-C - Install A-B-C fire extinguishers in the home and teach family members how to use them. (A-B-C works on all types of fires and recommended for home - read label.)

Call local fire - Ask local fire department if they will inspect your home for fire safety and prevention.

Teach kids - Explain to children that matches and lighters are TOOLS, not toys! And teach children if they see someone playing with fire they should tell an adult right away! And finally, teach children how to report a fire and when to call 9-1-1.

Prevent common fires - Pay attention when cooking & don't smoke in bed!

During A Fire:

If only a small fire that's not spreading too fast ...

Try to put out...? - Use a fire extinguisher or water (unless it's an electrical or grease fire) ... and never try to put out a fire that's getting out of control!

- **electrical fire** - never use water… use a fire extinguisher approved for electrical fires
- **oil or grease fire in kitchen** - smother fire with baking soda or salt (or, if burning in pan or skillet, carefully put a lid over it -- but don't try to carry pan outside!)

If fire is spreading ...

GET OUT - DO NOT take time to try to grab anything except your family members! Once outside, do NOT try to go back in (even for pets) - let the firemen do it! Ask a neighbor to call fire department if not already called.

GET DOWN - Stay low to the ground under the smoke by crawling on your hands and knees or squat down and walk like a duck… but keep moving to find a way out!

Closed door - Using the back of your hand (not your palm) always feel the top of the door, doorknob, and the crack between the door and door frame before you open a closed door!

- **if door is cool** - leave quickly, close door behind you and crawl to an exit
- **if door is hot** – DO NOT open it ... try to find another way out

No way out - If you can't find a way out of the room you're trapped in (door is hot and too high to jump) then hang a white or light-colored sheet, towel or shirt outside a window to alert firemen.

Use stairs - Never take the elevator… always use stairs!

If YOU are on fire - If your clothes ever catch fire, **STOP** what you're doing, **DROP** to the ground, cover your face and **ROLL** until the fire goes out. Running only makes the fire burn faster!

After A Fire:

Don't go in there - Never enter a fire-damaged building until the authorities say it is okay.

Look - Watch for signs of smoke or heat in case the fire isn't totally out.

Utilities - Have an electrician check your household wiring before you turn the power back on and DO NOT try to reconnect any utilities yourself!

Damage - Look for structural damage (roof, walls, floors, etc.) since they may be weak.

Call for help - Your local disaster relief service (Red Cross, Salvation Army, etc.) can help provide shelter, food, or personal items that were destroyed.

Insurance - Call your insurance agent or representative and…

- Keep receipts of all clean-up and repair costs (for both insurance and income taxes).
- Do not throw away any damaged goods until an official inventory has been taken by your insurance company.

If you rent - Contact your landlord since it is the owner's responsibility to prevent further loss or damage to the site.

Move your stuff - Secure your personal belongings or move them to another location, if possible.

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

To learn more about fire safety and fire prevention visit the U.S. Fire Administration's web site www.usfa.fema.gov or contact your local fire department, state or provincial emergency management official, or your insurance agent or representative.

Wildfires are intense fires that are usually caused by careless humans or lightning. Campfires, children playing with matches or lighters, and cigarettes are the most common things that cause brush fires or wildfires so please be careful when you're out in deserts, mountains, or any other heavy vegetation areas. And please don't toss cigarettes out when driving!

NEVER leave a campfire burning - make sure it is completely out using plenty of water before leaving the area. Stir the coals around with a stick or log while pouring water over them to ensure all the coals get wet and they are no longer hot. Any hot coals left unattended can be easily ignited by wind since they can stay hot for 24 - 48 hours!

When building a campfire, always choose a level site, clear away any branches and twigs several feet from the fire, and never build a fire beneath tree branches or on surface roots. Also, build at least 10 feet (3 m) from any large rocks that could be blackened by smoke or cracked from the fire's heat.

See your local Forest Service office or Ranger Station for more information on campfires and permits. (Or visit www.fs.fed.us or www.forest.ca)

Before A Wildfire (Fire Safety Tips):

Prepare - See WILDFIRE MITIGATION at beginning of this Section.

Learn fire laws - Ask fire authorities or the forestry office for information on fire laws (like techniques, safest times to burn in your area, etc.)

Could they find & reach you? - Make sure that fire vehicles can get to your property and that your address is clearly marked.

Safety zone - Create a 30-100 foot (9-30 m) safety zone around your home. *(see WILDFIRE MITIGATION)*

Teach kids - Explain to children that matches and lighters are TOOLS, not toys... and if they see someone playing with fire tell an adult right away! And teach kids how to report a fire and when to call 9-1-1.

Tell authorities - Report any hazardous conditions that could cause a wildfire.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During A Wildfire:

Listen - Have a radio to keep up on news, weather and evacuation routes.

Evacuate? – If you are told to leave - do so ... and IF you have time also…

- Secure your home - close windows, vents, doors, etc.
- Turn off utilities and tanks at main switches or valves, if instructed to do so.
- Turn on a light in each room to increase the visibility of your home in heavy smoke.
- Review WILDFIRE MITIGATION at front of this section.

Head downhill – Fire climbs uphill 16 times faster than on level terrain (since heat rises) so always head down when evacuating the area.

Food & water - If you prepared ahead, you'll have your **Disaster Supplies Kit** handy to **GRAB & GO**… if not, gather up enough food and water for each family member for at least 3 days or longer!

Be understanding - Please realize the firefighters main objective is getting wildfires under control and they may not be able to save every home. Try to understand and respect the firefighters' and local officials' decisions.

After A Wildfire:

Don't go in there - Never enter fire-damaged areas until authorities say okay.

Look - Watch for signs of smoke or heat in case the fire isn't totally out.

Utilities - Have an electrician check your household wiring before you turn the power back on and DO NOT try to reconnect any utilities yourself!

Damage - Look for structural damage (roof, walls, floors) -- may be weak.

Call for help - Your local disaster relief service (Red Cross, Salvation Army, etc.) can help provide shelter, food, or personal items that were destroyed.

Insurance - Call your insurance agent or representative and…

- Keep receipts of all clean-up and repair costs (for both insurance and income taxes).
- Do not throw away any damaged goods until an official inventory has been taken by your insurance company.

If you rent - Contact your landlord since it is the owner's responsibility to prevent further loss or damage to the site.

Move your stuff - Secure your belongings or move them to another location.

Recovery tips - See TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about… A Flood?

Floods are the most common natural disaster. Some floods develop over a period of several days, but a flash flood can cause raging waters in just a few minutes! Mudflows are another danger triggered by flooding that can bury villages without warning (especially in mountainous regions).

Everyone is at risk from floods and flash floods, even in areas that seem harmless in dry weather. Always listen to the radio or TV to hear the latest updates. Some other types of radios are the NOAA (National Oceanic and Atmospheric Administration) Weather Radio and Environment Canada's Weatheradio with battery backup and a tone-alert feature that automatically alert you when a Watch or Warning has been issued.

Before A Flood (or Heavy Rain):

Prepare - Review FLOOD MITIGATION at beginning of this Section.

Learn the buzzwords - Learn the terms / words used with floods...

- **Flood watch** - flooding is possible
- **Flash flood watch** - flash flooding is possible so move to higher ground if in a low-lying area
- **Flood warning** - flooding is occurring or will occur soon so listen to radio or TV for updates or evacuation alerts
- **Flash flood warning** - flash flood is occurring so seek higher ground on foot immediately
- **Urban and Small Stream Advisory** - flooding of small streams, streets and low-lying areas is occurring

Learn risks - Ask your local emergency management office if your property is a "flood-prone" or high-risk area and what you can do to mitigate (reduce risks to) your property and home. Find out what official flood warning signals are and what to do when you hear them. Also ask if there are dams in your area and if they could be a hazard.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Learn to shut off - Know where and how to shut off electricity, gas and water at main switches and valves -- and ask local utilities for instructions.

Get insurance...? - Talk to your agent and find out more about the **National Flood Insurance Program**. *(see FLOOD MITIGATION)*

Did you know…

… you can buy federal flood insurance through most major private insurance companies and licensed property insurance agents?!

… you do not have to own a home to have flood insurance as long as your community participates in the **NFIP**?!

… the **NFIP** offers coverage even if you live in a flood-prone area?!

… the **NFIP** offers basement and below ground level coverage?!

Put it on film - Either videotape or take pictures of your home and personal belongings and store them in a safe place (like a fireproof box or a safety deposit box) along with important papers.

During A Flood (or Heavy Rain):

Be aware - Listen to local news and watch for flash floods especially if near streams, drainage channels, and areas known to flood.

Get to higher ground - If in a low-lying area, move to higher ground.

Prepare to evacuate – *(see EVACUATION*), and IF time also…

- Secure your home and move important items to upper floors.
- Turn off utilities at main switches or valves if instructed by authorities and DO NOT touch electrical equipment if you are wet or standing in water!
- Fill up your car with fuel.

Obey warnings - If road signs, barricades, or cones are placed in areas - OBEY THEM! Most areas have fines for people who ignore these posted warnings, especially if they get stuck or flooded! DO NOT drive around barricades… find another way to get where you are going!

Things to avoid:

- **moving water** - 6 inches (15 cm) of moving water can knock you off your feet and 2 ft (0.6 m) of moving water can float a car
- **flooding car** - if flood waters rise around your car, get out and move to higher ground if you can do it safely! (Don't try to walk through moving water!)
- **bad weather** - leave early enough so you are not trapped
- **flooded areas** - roadways and bridges may be washed-out
- **downed power lines** - extremely dangerous in floods!!

After A Flood (or Heavy Rain):

Things to avoid:

- **flood waters** - stay away from flood waters since may be contaminated by oil, gasoline or raw sewage or may be electrically charged from underground or downed power lines - wait for local authorities to approve returning to flooded areas
- **moving water** - 6 inches (15 cm) of moving water can knock you off your feet and 2 ft (0.6 m) of moving water can float a car
- **flooded areas** - roadways and bridges may be washed-out or weakened
- **downed power lines** - extremely dangerous and report them to the power company

Obey warnings - If road signs, barricades, or cones are placed in areas - OBEY THEM! Most areas have fines for people who ignore these posted warnings, especially if they get stuck or flooded! DO NOT drive around these barricades… find another way to get where you are going!

Strange critters - Watch out for snakes and other wildlife in areas that were flooded. Don't try to care for a wounded critter since it may try to attack you... call your local animal control office or animal shelter.

Flooded food - Throw away food that has come into contact with flood waters since eating it can make you sick.

Drinking water - Wait for officials to advise when water is safe to drink.

Wash your hands - Wash hands often with clean water and soap since flood waters are dirty and full of germs!

Use bleach – The best thing to use for cleaning up flooded areas is household bleach since it will help kill germs.

Listen - Continue listening to your battery-powered radio for updates on weather and tips on getting assistance for housing, clothing, food, etc.

Insurance - Call your insurance agent to see if you're covered for flooding.

Mold - Consider asking a restoration professional to inspect your house for mold. *(see AIR QUALITY MITIGATION)*

Good site on cleaning basement - If you can access the Internet, visit the Seattle & King County Public Health web site for good tips on "Cleaning basements after a flood" at www.metrokc.gov/health/disaster/floodbas.htm

Recovery tips - See TIPS ON RECOVERING FROM A DISASTER.

What are YOU gonna do about… HAILSTORMS?

Hail is the largest form of precipitation that begins as tiny ice pellets and grows by colliding with supercooled water droplets as it gets tossed around violently in strong updraft winds. As the pellet continues to be tossed, it builds layer by layer until it becomes so heavy that it drops out of the sky as hailstones.

Hailstone diameters can range from 1/16 of an inch to 5 inches (2 mm to 13 mm) - basically meaning they can range in size from tiny pebbles to golfballs to grapefruits or softballs! One of the largest hailstones ever recorded in the U.S. weighed 1.67 pounds and had a 17.5 inch (44 cm) circumference.

Hail is usually present in powerful storms like tornadoes, thunderstorms and even some winter storms mainly due to the strong winds and rapidly rising air masses needed to form hailstones.

Hail occurs across Canada but more frequently happens in the Canadian Prairies (particularly the Calgary-Medicine Hat area). This region can expect up to 10 hailstorms a year and most of the damaging hailstorms generally occur from May to October. The U.S. averages about 3,000 hailstorms each year across the country and a majority of the storms occur between March and June.

The worst hailstorm in Canadian history hit Calgary, Alberta in September 1991. The 30-minute downpour caused almost $400 million in insurance claims devastating crops, property and livestock. In 1996 Alberta started a hail suppression program using aircraft that fly over developing storms and seed clouds with silver iodide particles to reduce the size of the hailstones.

BEFORE A HAILSTORM:

Since hailstorms are pretty localized events, it is difficult to prepare for "hail", however please review the other topics that create hailstorms (Thunderstorms, Tornadoes and Winter storms) to learn what to do and how to protect yourselves during these events!

Listen - Keep up on local radio or TV weather forecasts and updates.

Park it - If possible, secure vehicles in a garage or under substantial cover.

Bring 'em in - Put pets and livestock in some type of shelter for their safety.

Stay put - Stay inside until the entire storm system passes.

During a Hailstorm:

Listen - Keep radio or TV tuned in for more information and updates on weather conditions and other types of warnings.

IF INDOORS – Stay inside until the storm passes and don't try to go out and protect your property!

IF OUTDOORS - Take shelter under the strongest structure you can find (especially if hailstones are large!)

IF IN A VEHICLE - Carefully pull over to the shoulder and seek shelter under an overpass or the closest substantial structure available.

After a Hailstorm:

Listen - Continue listening to radio or TV for updates on weather.

Check it out - Check for damage to trees and shrubs because, if damaged, your roof most likely is too. Also check your vehicles and structures for damage but don't put yourself in danger if storms are still active!

Stop leaks - Cover up holes in your roof and broken windows in your car and home to keep water out.

Insurance - Call your insurance agent or representative to set up a visit to your home or to take your vehicle down for inspection.

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about…
Hazardous Materials?

Chemical plants are one source of hazardous materials, but there are many others that exist in large industry, small businesses, and homes. There are about 500,000 products that could pose a physical or health hazard -- things ranging from waste produced by a petroleum refinery to materials used by the dry cleaners to pesticides stored in your home.

Most hazardous materials are transported around the country by road, rail and through pipelines potentially causing spills on highways, near railroad tracks or underground. Many U.S. communities have a **Local Emergency Planning Committee** (**LEPC**) that keeps local planners, companies and members of the community informed of potential risks. All companies that have hazardous chemicals must report to the LEPC every year and the public is encouraged to get involved. We [the public] should all learn more about hazardous materials and how they can affect our lives so contact your emergency management office to learn more.

We're going to cover two topics here -- **HAZARDOUS MATERIALS DISASTER** (where a spill or incident affects an area or community) and **HOUSEHOLD CHEMICAL EMERGENCIES** (how to handle products and react if there's an emergency in the home). Also, please review the TERRORISM topic since it covers several biological and chemical agents that are also classed as "hazardous materials".

Before a Hazardous Materials Disaster:

Learn the buzzwords - Ask your local officials about emergency warning procedures and terms...

- **Outdoor warning sirens or horns** - ask what they mean and what to listen for
- **Emergency Alert System (EAS)** - information and alerts via TV and radio
- **"All-call" telephoning** - an automated system for sending recorded messages via telephone
- **Residential route alerting** - messages announced from vehicles equipped with public address systems (loud speakers on top of car or van)

Learn risks - Ask your Local Emergency Planning Committee (LEPC), Emergency Management Office, or Fire Department about community plans for responding to hazardous materials accident at a plant or a transportation accident involving hazardous materials. Also ask where large quantities of extremely hazardous substances are stored and where they are used.

Make a plan - Use LEPC's or agency's information to see if your family is at risk, especially people living close to freeways, railroads, or factories which produce or transport toxic waste. And review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Take a tour - Arrange a neighborhood tour of industries that produce or transport toxic waste and include neighbors, local officials and the media.

Pick a room - It could take authorities time to determine what (if any) the hazardous material is so pick a room in advance that your family could use if you are told to stay indoors for several hours. It's best to pick an internal room where you could block out air, if instructed to do so. To save critical time consider measuring and cutting plastic sheets in advance for each opening (vents, windows, and doors). Remember, a toilet is usually vented meaning outside air comes in constantly or when flushed (depends on design) - just FYI in case you choose bathroom as a safe room.

Calculate air for room - Keep in mind people can stay in a sealed off room for only so long (or you'll run out of air!) FEMA suggests 10 square feet of floor space per person (like 5ft x 2ft / 1.5m x 0.6m) will provide enough air to prevent carbon dioxide buildup for up to 5 hours.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Hazardous Materials Disaster:

Call for help - If you see a hazardous materials accident, call 9-1-1, local emergency number, or the fire department.

Listen - Keep radio or TV tuned in for more information, especially if you hear a warning signal... and stay calm!

IF INDOORS – If told to stay inside, do it - and ...

- Close your windows, vents, and fireplace dampers and turn off A/C or heat and fans to reduce air drawn in from outside.
- Keep a radio with you at all times.
- Grab your **Disaster Supplies Kit** and get to a closed off room.
- Seal gaps under doorways and windows with wet towels or plastic and duct tape (see above tips on picking a room and calculating air!)

IF OUTDOORS - Stay upstream, uphill, or upwind from the disaster since hazardous materials can be carried by wind and water quickly. Try to get at least ½ mile or kilometer away or as far away as possible!

IF IN A VEHICLE - Close your windows and shut off vents to reduce risk.

Stay away - Get away from the accident site to avoid contamination.

Evacuate...? - If you are told to evacuate… do it! If officials say you have time, close windows, shut vents and turn off attic fans. *(see EVACUATION)*

What to wear - Keep your body fully covered and wear gloves, socks and shoes. (Even though these may not keep you totally safe, it can help!)

Things to avoid:

- **chemicals** - spilled liquid materials or airborne mists
- **contaminated food or water** - don't eat or drink any food or water that may have been exposed to hazardous materials

After a Hazardous Materials Disaster:

Don't go there - Do not return home until local authorities say it is safe.

Air out - Open windows, vents and turn on fans in your home.

Listen - Keep up with local reports from either the radio or TV.

Clean up - A person, critter or item that has been exposed to a hazardous chemical could spread it.

- **decontamination** - follow instructions from local authorities since it depends on the chemical. You may need to shower or rinse off or may be told to stay away from water - check first!
- **strange symptoms** - if unusual symptoms show up, get to a hospital or medical expert right away! Remove contaminated clothing and put on fresh, loose, warm clothing and listen to local reports on the radio.
- **store clothes & shoes** - put exposed clothing and shoes in tightly sealed containers/bags without touching other materials and call local authorities to ask how to get rid of them
- **tell people you've been exposed** - tell everyone who comes in contact with you that you may have been exposed to a toxic substance
- **land and property** - ask authorities how to clean the area

Strange vapors or danger - Report any strange vapors or other dangers to the local authorities immediately.

To learn more about hazardous materials, visit the U.S. Environmental Protection Agency's Chemical Emergency Preparedness and Prevention

Office (CEPPO) at www.epa.gov *(do a Search on CEPPO or "Browse Topics" then several to choose from like Emergencies, Pollutants/Toxics, Wastes, etc.)*

Or visit Environment Canada at www.ec.gc.ca *(Click on "Topics" then several to choose from like Environmental Emergencies, Pollution, Waste Management, etc.)* ... or the Canadian Transport Emergency Centre of the Department of Transport at www.tc.gc.ca/canutec/

Before a Household Chemical Emergency:

Learn risks - Call your Local public health department or the Environmental Protection Agency for information about hazardous household materials.

Read labels - Always read product labels for proper use and disposal of chemicals.

Recycle it? - Call your local recycling center or collection site to ask what chemicals can be recycled or dropped off for disposal -- many centers take things like car batteries, oil, tires, paint or thinners, etc.

Store it - Keep all chemicals and household cleaners in safe, secure locations out of reach of small children.

Put it out - Don't smoke while using household chemicals.

During a Household Chemical Emergency:

Call for help - Call your local Poison Control Center, 9-1-1, fire department, hospital or emergency medical services.

First aid tips - Follow instructions on label and see Basic First Aid tips for POISONING in Section 3.

What are YOU gonna do about…
Hurricanes, Cyclones & Typhoons?

Hurricane season in North America is generally between June and November. Hurricanes are tropical cyclones with torrential rains and winds of 74 - 155 miles per hour (120 - 250 km/h) or faster. These winds blow in a counter-clockwise direction (or clockwise in the Southern Hemisphere) around a center "eye". The "eye" is usually 20 to 30 miles (32 to 48 km) wide, and the storm may be spread out as far as 400 miles (640 km)!

As the hurricane approaches the coast, a huge dome of water (called a storm surge) will crash into the coastline. Nine out of ten people killed in hurricanes are victims of storm surge. Hurricanes can also cause tornadoes, heavy rains and flooding.

What's with all the different names?

You may have heard different words used to describe different storms depending on where you live in the world. It is confusing but hopefully we can help explain all the different names… and hopefully we don't make any weather specialists angry.

Cyclone - an atmospheric disturbance with masses of air rapidly rotating around a low-pressure center… (sort of like a dust devil or a tornado)

Tropical Depression - maximum surface winds of less than 39 miles per hour (62 km/h) over tropical or sub-tropical waters with storms and circular winds

Tropical Storm - the tropical cyclone is labeled a Tropical Storm if winds are between 39-73 mph (62 - 117 km/h) and given a name to track it

Hurricane, Typhoon, Tropical cyclone - surface winds are higher than 74 mph (120 km/h)… and depending on where it is happening will determine what it is called

Where in the world do they use these names?

(Please note: We are only listing a few major countries or areas for each!)

Cyclone - used in several parts of the world - **Indian Ocean, Australia, Africa, SW and southern Pacific Ocean**

Hurricane - used in North Atlantic Ocean, Northeast Pacific Ocean (east of the dateline), or South Pacific Ocean (east of 160) - **both coasts of North America, Puerto Rico, Caribbean Islands, and Central America**

Typhoon - used in Northwest Pacific Ocean west of the dateline - **Guam, Marshall Islands, Japan, Philippines, Hong Kong, coastal Asia**

Tropical cyclone - used in Southwest Pacific Ocean west of 160E or most of the Indian Ocean - **Australia, Indonesia, Madagascar, Africa, Middle East**

Hurricanes are classed into five categories based on wind speeds, central pressure, and damage potential. The chart below is called the Saffir-Simpson Hurricane Scale with some examples of damage provided by FEMA:

Scale # (Category)	Sustained Winds	Damage	Storm Surge
1	74-95 mph 119-153 km/h	**Minimal**: Untied mobile homes, vegetation & signs	4-5 ft 1.2-1.5 m
2	96-110 mph 154-177 km/h	**Moderate**: All mobile homes, roofs, small crafts, flooding	6-8 ft 1.8-2.4 m
3	111-130 mph 178-209 km/h	**Extensive**: Small buildings, low-lying roads cut off	9-12 ft 2.7-3.6 m
4	131-155 mph 210-249 km/h	**Extreme**: Roofs and mobile homes destroyed, trees down, beach homes flooded	13-18 ft 3.9-5.4 m
5	> 155 mph > 250 km/h	**Catastrophic**: Most bldgs and vegetation destroyed, major roads cut off, homes flooded	> 18 ft > 5.4 m

Before a Hurricane:

Prepare - Review WIND, FLOOD, and LIGHTNING MITIGATION at beginning of this Section.

Learn the buzzwords - Learn the terms / words used with hurricanes...

- **Hurricane/Tropical Storm Watch** - hurricane/tropical storm is possible within 36 hours so listen to TV and radio updates
- **Hurricane/Tropical Storm Warning** - hurricane/tropical storm is expected within 24 hours -- may be told to evacuate (if so, do it) and listen to radio or TV for updates
- **Short term Watches and Warnings** - warnings provide detailed information on specific hurricane threats (like flash floods and tornadoes)

Listen - Keep local radio or TV tuned in for weather forecasts and updates. (Some other radios to consider are Environment Canada's Weatheradio and NOAA's Weather Radio with battery backup and tone-alert feature that automatically alert you when a Watch or Warning has been issued.)

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Learn to shut off - Know where and how to shut off electricity, gas and water at main switches and valves -- ask local utilities for instructions.

Batten down - Make plans to protect your property with storm shutters or board up windows with plywood that is measured to fit your windows. Tape does not prevent windows from breaking. *(See WIND MITIGATION)*

Get insurance...? - Talk to your agent and find out more about the **National Flood Insurance Program**. *(see FLOOD MITIGATION)*

Put it on film - Either videotape or take pictures of your home and personal belongings and store them in a safe place (like a fireproof box or a safety deposit box) along with important papers.

During a Hurricane Threat:

Listen - Have a battery-operated radio available to keep up on news reports and evacuation routes.

Evacuate? – If you are told to evacuate - do it! *(see EVACUATION)* And if you have time also…

- Secure your home - close storm shutters or put up boards on windows, moor your boat, and secure outdoor objects or put them inside since winds will blow them around.
- Turn off utilities at main switches or valves, if instructed.
- Fill up your car with fuel.

Food & water - If you prepared ahead, you'll have your **Disaster Supplies Kit** handy to GRAB & GO… if not, gather up enough food and water for each family member for at least 3 days!

IF INDOORS – Stay inside!

- Find a SAFE SPOT - get to a small interior room, closet or hallway ... or lie on the floor under a heavy desk or table.

IF IN A MULTI-STORY BUILDING – Go to the first or second floor!

- Find a SAFE SPOT - get to a small interior room or hallway ... or lie on the floor under heavy desk or table.
- Move away from outside walls and windows.
- Realize the electricity may go out and alarms and sprinkler systems may go on.

Pets - Make arrangements for your pets since most shelters won't allow them.

Things to avoid:

- **moving water** - 6 inches (15 cm) of moving water can knock you off your feet and 2 ft (0.6 m) of moving water can float a car
- **flooding car** - if flood waters rise around your car, get out and move to higher ground if you can safely! (Don't try to walk through moving water!)
- **bad weather** - leave early enough so you are not trapped
- **flooded areas** - roadways and bridges may be washed-out
- **downed power lines** - extremely dangerous in floods!!

Stay indoors - If you do not evacuate, stay indoors and stay away from glass doors and windows. Keep curtains and blinds closed and remember, a lull in the storm could only be the middle of the storm (the "eye") and winds can start again! Keep listening to radio or TV reports.

Limit phone calls - Only use telephones in an emergency so it keeps lines open for local authorities!

After a Hurricane:

Stay put - Stay where you are (if you're in a safe location) and don't return home (if you've been evacuated) until local authorities say it's okay.

Listen - Continue listening to your battery-powered radio for updates on weather and tips on getting assistance for housing, clothing, food, etc.

Stick together - Keep family together since this is a very stressful time and try to find chores for children so they feel they're helping with the situation.

Things to avoid:

- **flood waters** - stay away from flood waters since it may be contaminated by oil, gasoline or raw sewage or may be electrically charged from underground or downed power lines - wait for local authorities to approve returning to flooded areas
- **moving water** - 6 inches (15 cm) of moving water can knock you off your feet and 2 ft (0.6 m) of moving water can float a car
- **flooded areas** - roadways and bridges may be washed-out or weakened
- **downed power lines** - extremely dangerous and report them to power company

Drinking water - Wait for officials to advise when water is okay to drink!

RED or GREEN sign in window – After a disaster, Volunteers and Emergency Service personnel usually go door-to-door to check on people. By placing a sign in your window that faces the street near the door, you can let them know if you need them to STOP HERE or MOVE ON (if home is still standing!). Either use a piece of RED or GREEN construction paper or draw a big RED or GREEN "X" (using a crayon or marker) on a piece of paper and tape it in the window.

- RED means STOP HERE!
- GREEN means EVERYTHING IS OKAY…MOVE ON!
- Nothing in the window would also mean STOP HERE!

Flooded food - Throw away any food that has come into contact with flood waters since eating it can make you sick!

Wash your hands - Use clean water and soap when washing hands.

Use bleach – The best thing to use for cleaning up flooded areas is household bleach since it will help kill germs.

Insurance - Call your insurance agent to set up a visit to your home.

Mold - Consider asking a restoration professional to inspect your house for mold. *(see AIR QUALITY MITIGATION)*

Donations – Lots of people want to help victims of a hurricane and here are some tips…

- **wait & see** - don't donate food, clothing or other personal items unless they are specifically requested
- **money** - donations to a known disaster relief group, like the Red Cross, is always helpful
- **volunteers** - if local authorities ask for your help, bring your own water, food and sleeping gear

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about…
A Nuclear Power Plant Emergency
(or a Nuclear Incident)?

The World Nuclear Association reports as of 2002 over 440 nuclear power reactors in 31 countries produce over 16 percent of the total electricity generated worldwide. There are over 100 commercial power plants in the U.S. (in most states across the country) and 20 power stations in Canada (18 in Ontario, 1 in Quebec and 1 in New Brunswick) meaning millions of citizens live within 10 miles (16 km) of an operating plant.

Even though national governments and associations monitor and regulate construction and operation of plants, accidents are possible and do happen. An accident could result in dangerous levels of radiation that could affect the health and safety of the public living near the nuclear power plant, as well as people up to 200 miles (320 km) away depending on winds and weather -- so millions and millions of North Americans could potentially be affected!

Please note: Some other types of incidents involving possible radiation exposure may be a "radiological" event (like a "dirty bomb"), a "dirty nuke" (a suitcase-sized nuclear device), or a "weapon of mass destruction" (like a nuclear missile). "Dirty bombs" are briefly covered in the next topic called TERRORISM, but please review the next few pages before moving on. The chances of a nuclear emergency happening are remote but learn the risks, make a plan so you know how to react, and listen to authorities.

How is radiation detected?

You cannot see or smell radiation - scientists use special instruments that can detect even the smallest levels of radiation. If radiation is released, authorities from Federal and State or Provincial governments and the utility will monitor the levels of radioactivity to determine the potential danger so they can protect the public.

What is the most dangerous part of a nuclear accident?

Radioactive iodine - nuclear reactors contain many different radioactive products, but the most dangerous one is radioactive iodine which, once absorbed, can damage cells of the thyroid gland. The greatest population that suffers in a nuclear accident is **children** (including unborn babies) since their thyroid is so active, but all people are at risk of absorbing radioactive iodine.

How can I be protected from radioactive iodine?

Potassium iodide (KI) - can be purchased over-the-counter now (usually from companies selling disaster-related kits) and is known to be an effective thyroid-blocking agent. In other words, it fills up the thyroid with good iodine that keeps the radioactive iodine from being absorbed into our bodies.

What if I am allergic to iodine?

According to the United States Nuclear Regulatory Commission Office of Nuclear Material Safety and Safeguards, the FDA suggests that risks of allergic reaction to potassium iodide are minimal compared to subjecting yourself to cancer from radioactive iodine. Ask your doctor or pharmacist what you should keep on hand in the event of an allergic reaction.

Many European countries stockpile potassium iodide (KI), especially since the Chernobyl incident. Several states within the U.S. are considering or already have stockpiles of KI ready in case of a nuclear power plant accident or incident as part of their Emergency Planning.

As of March 2003, the FDA has approved 3 KI products - Thyro-Block, Iosat, and Thyrosafe. To learn more visit www.fda.gov/cder/drugprepare/KI_Q&A.htm or www.bt.cdc.gov/radiation/ki.asp

Community Planning for Emergencies

Local, state and provincial governments, Federal agencies and utilities have developed emergency response plans in the event of a nuclear power plant accident.

U.S. plans define 2 "emergency planning zones" (EPZs)

- **Plan One** - covers a 10-mile radius from nuclear plant where people could possibly be harmed by radiation exposure
  NOTE: People within 10-mile radius are given emergency information about radiation, evacuation routes, special arrangements for handicapped, etc. via brochures, phone books, and utility bills.

- **Plan Two** - usually covers up to a 50-mile radius from plant where accidentally released radioactive materials could contaminate water supplies, food crops and livestock

Canada's Provincial Nuclear Emergency Response Plans define 3 "zones"
(Per Ontario Ministry of Public Safety & Security EMO PNERP Backgrounder)

- **Contiguous Zone** - extends approximately 3 kilometres from nuclear facility where evacuation and sheltering may be ordered

- **Primary Zone** - extends approximately 10 kilometres from the nuclear facility where evacuation and sheltering may be ordered

- **Secondary Zone** - extends approximately 50 kilometres from the nuclear facility where radioactive contamination could cause monitoring and/or bans on some food and water sources

  NOTE: Public Education brochures are available to residents and businesses within the Primary Zone (10 km) of each nuclear facility.

3 Ways to Reduce Radiation Exposure

DISTANCE - The more distance between you and the source of radiation, the less radiation you will receive - that's why in a serious nuclear accident you are told to evacuate.

SHIELDING - Heavy, dense materials between you and radiation is best - this is why you want to stay indoors since the walls in your home should be good enough to protect you in some cases… but listen to radio and TV to learn if you need to evacuate!

TIME - Most radioactivity loses its strength rather quickly so by limiting your time near the source of radiation, it reduces the amount you receive.

Before a Nuclear Emergency or Incident:

Learn the buzzwords - Know terms used in both countries to describe a nuclear emergency: **U.S.** / **(Canada)**...

- **Notification of Unusual Event / (Reportable Event)** - a small problem has occurred at the plant. No radiation leak is expected. Federal, state/provincial and county/municipal officials will be told right away. No action on your part will be necessary.
- **Alert / (Abnormal Incident)** - a small problem has occurred, and small amounts of radiation could leak inside the plant. This will not affect you and you shouldn't have to do anything.
- **Site Area Emergency / (Onsite Emergency)** - a more serious problem… small amounts of radiation could leak from the plant. If necessary, officials will act to ensure public safety. Area sirens may be sounded and listen to your radio or TV for information.
- **General Emergency / (General Emergency)** - the MOST serious problem… radiation could leak outside the plant and off the plant site. In most cases sirens will sound so listen to local radio or TV for reports. State/Provincial and county/municipal officials will act to assure public safety and be prepared to follow their instructions!

Learn signals - Ask about your community's warning system and pay attention to "test" dates to learn if you can HEAR it. Nuclear power plants are required to install sirens and other warning devices to cover a 10-mile area around the plant in the U.S. (If you live outside the 10-mile area you will probably learn of the event through local TV and radio, but just be aware winds and weather can impact areas as far as 200 miles [320 km] away!!)

Learn risks - Ask the power company operating the nuclear power plant for brochures and information (which they or government sends automatically to people within a 10-mile [10-km in Canada] radius of the plant).

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**. Double check on emergency plans for schools, day cares or places family may be and where they'll go if evacuated.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Nuclear Emergency or Incident:

Stay calm - Not all accidents release radiation - may only be in power plant!

Listen - Turn on radio or TV. Authorities will give specific instructions and information… pay attention to what THEY tell you rather than what is written in this Manual since they know the facts for each specific incident.

Evacuate..? - Only leave if told to do so by local authorities ... and ...

- Grab your **Disaster Supplies Kit**.
- Close doors, windows and fireplace damper.
- Close car windows and vents and use "re-circulating" air.
- Keep listening to radio for evacuation routes & updates.

As long as you are NOT told to evacuate, do the following…

IF INDOORS - If you are not told to evacuate, stay inside!

- Close doors and windows and your fireplace damper.
- Turn off air conditioner, ventilation fans, furnace and other intakes (they pull in air from outside).
- Go to a basement or underground area (if possible).
- Keep a battery-operated radio with you to hear updates.
- Stay inside until authorities tell you it is safe to go out!

IF OUTDOORS - Get indoors as soon as possible!

- Cover mouth and nose with a cloth or handkerchief.
- Once inside, remove clothing, take a good shower and put on fresh clothing and different shoes. Put clothes and shoes you were wearing in plastic bags, seal and store. Local authorities can tell you what to do with bags.

IF IN A VEHICLE - Keep windows up, close vents, use "recirculating" air and keep listening to radio for updates. If possible, drive away from site.

IF AN EXPLOSION OR BLAST - (like from a possible nuclear device)

- Do NOT look directly at flash, blast or fireball!
- Stay low and watch out for flying debris or fires.

- A blast could create an electromagnetic pulse (EMP) that may fry electronics connected to wires or antennas like cell phones, computers, cars, etc. May harm people with pacemakers.

Food - Put food in covered containers or in the refrigerator -- any food that was not in a covered container should be washed first.

Pets & livestock - Get them indoors or in shelters with clean food and water that has not been exposed to air-borne radiation (food and water that has been stored), especially milk-producing animals.

Take potassium iodide..? - IF radioactive iodine has been released into the air from a power plant accident, some states *may* decide to provide KI pills mentioned at beginning of this topic to people in a 10-mile radius.

(In June 2002 President Bush signed a provision that gave state and local governments supplies of potassium iodide for people within 20 miles of a nuclear power plant, increasing protection beyond the Nuclear Regulatory Commission's current 10-mile radius.[4] This is at the option of state and local government and realize it will take time for them to disperse to citizens ... unless you prepare in advance and keep KI handy for such emergencies, but only take if officials confirm radiation was released outside the plant!)

NOTE: Take KI pills ONLY as directed by state, provincial or local public health authorities and follow instructions on the package exactly! *(See pages 74-75.)*

After a Nuclear Emergency or Incident:

Listen - Keep radio and TV tuned in -- stay in until authorities say all clear.

Clean up - If you were possibly exposed to radiation...

- **store clothes & shoes** - put clothing and shoes in tightly sealed containers or plastic bags and ask health officials what to do with them
- **shower** - wash body & hair to remove radioactive particles
- **land and property** - ask authorities how to clean up area

Weird symptoms - Seek medical attention if you have symptoms like upset stomach or feel queasy after a reported incident since it could be related to radiation exposure. *(see page 105 for more about radiation sickness)*

Gardens – Authorities will provide information concerning safety of farm and homegrown products - or check with agricultural extension agent.

Crops - Unharvested crops are hard to protect but crops that are already harvested should be stored inside, if possible.

Milk - Local officials should inspect milk from cows and goats before using.

What are YOU gonna do about… TERRORISM?

Terrorism is the use of force or violence against persons or property usually for emotional or political reasons or for ransom. The main goal of terrorists is to create public fear and panic.

Obviously there is a lot of anxiety since the September 11, 2001 attacks on the U.S., however, being afraid or worrying is very unhealthy - especially about something you have little control over. But remember, terrorist attacks are a very low risk possibility. Let's put a few "risks" in perspective ... the chances of having high blood pressure is 1 in 4 ... the odds of dying from cancer is 1 in 500 ... and the odds of dying from anthrax is 1 in 56 million!

People need to remain calm about the threat of terrorist attacks and learn about some of the types, how to prepare for them, and what to expect in some cases. Discuss this with everyone - even the kids so they can talk about their feelings too. Stay current on news but don't obsess over it ... and just be aware of your surroundings as you go about your daily routines.

One type of terrorism that we can help prevent is the use of guns and bombs by children and youth against other groups of children at schools. A key solution to stopping this type of school violence is through communication, education and awareness – and it starts within the FAMILY!

The Federal Bureau of Investigation categorizes terrorism in two ways:

Domestic terrorism - terrorist activities are directed at certain groups or parts of the government within the U.S. without foreign direction.

> Some examples of domestic terrorism include shootings and bomb threats at schools, the Oklahoma City bombing of the Federal Building, and the letters mailed to various groups with a white powdery substance (anthrax scares).

International terrorism - terrorist activities are foreign-based by countries or groups outside the U.S.

> Some examples of international terrorism include bombings like the U.S.S. Cole in Yemen and U.S. Embassies in other countries, the attacks on the Pentagon and World Trade Center, hostage situations with civilians in various countries, or threats with weapons of mass destruction.

Until recently, most terrorist attacks involved bombs, guns, kidnappings and hijackings, but some other forms of terrorism involve cyber attacks, biological or chemical agents, radiological or nuclear devices (the last 4 now considered weapons of mass destruction).

Cyber attacks - computer-based attacks from individuals or terrorist groups causing severe problems for government, businesses and public in general (sometimes causing or leading to injury and death)

Biological agents - infectious microbes (tiny life forms), germs or other substances that occur naturally or are "designed" to produce illness or death in people, animals or plants -- can be inhaled, enter through a cut in the skin, or swallowed when eating or drinking

Chemical agents - poisonous vapors, liquids or solids that can kill or slow down or weaken people, destroy livestock or crops -- can be absorbed through the skin, swallowed or inhaled

Radiological threat or device - a "dirty bomb" or RDD uses conventional explosives to spread radioactive materials over a general or targeted area

Nuclear device - a bomb or missile using weapons grade uranium or plutonium (*please note, we covered nuclear-related incidents on pages 74-78*)

Weapons of mass destruction (WMD) - chemical, biological, radiological, and nuclear devices are now all classed as WMDs

Terrorism is quite an extensive topic now -- below we are listing some basic things to do before any type of terrorist attack. Then we'll cover specific types shown above in red - including what to do BEFORE, DURING and AFTER each and where to find more information. We also threw in some tips for handling "bomb threats" or "suspicious packages".

Keep in mind, the best thing you can do about terrorism is prepare yourself and your family for the unexpected, so please review this topic and the previous one on "nuclear" threats. By learning about potential threats, we are all better prepared to know how to react if the unthinkable happens.

Also review APPENDIX A on the Homeland Security Advisory System and APPENDIX B on some volunteer programs for Americans and Canadians.

Before Any Type of Terrorist Attack:

BE AWARE! - You should always be aware of your surroundings and report any suspicious activities to local authorities.

Stay current on alerts - Canada's OCIPEP *(pages 196-199)* and the U.S.'s Department of Homeland Security *(APPENDIX A)* post alerts on the Internet

Know the targets - Terrorists usually prefer to pick targets that bring little damage to themselves and areas that are easy to access by the public (like international airports, military and government buildings, major events,

schools, etc.) Some other high risk targets include water and food supplies, utility companies (esp. nuclear power plants) and high-profile landmarks.

Things to watch out for:

- **unknown packages** - DO NOT accept a package or case from a stranger
- **unattended bags** - DO NOT leave bags or purses alone (especially when traveling) and NEVER ask strangers to watch your stuff!
- **emergency exits** - always be aware of where Emergency EXITS are… just casually look around for the signs since most are marked well in public places

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

CYBER ATTACKS

There are 3 key risk factors related to information technologies (IT) systems:

- A direct attack against a system "through the wires" alone (called hacking) -- meaning an attacker or user "hacks" in or gains "**access**" to restricted data and operations.
- An attack can be a physical assault against a critical IT element -- meaning an attacker changes or destroys data, modifies programs or takes control of a system (basically can cause a loss of data "**integrity**" = data is no good).
- The attack can be from the inside -- meaning private information could get in the wrong hands and become public or identities stolen (basically "**confidentiality**" is broken = data is no longer secure or private).

Cyber attacks target computer networks that run government, financial, health, emergency medical services, public safety, telecommunications, transportation and utility systems - also known as "critical infrastructure".

Because technologies have improved our access to information, we have opened ourselves up for attacks by our enemies to destroy or alter this data. Cyberterrorism is different than computer crime or "hactivism" (which can be costly and a pain to fix but doesn't threaten lives or public safety.)

Cyberterrorism is usually done with a minimal loss of life but there are certain terrorist groups that could potentially use cyber attacks to cause human casualties or fear by disrupting transportation or public safety systems.

Again, we are not trying to cause worry or panic, but understand the possibility exists and services could be disrupted or cut off or man-made disasters could happen due to cyber attacks. For example, services like banking, gas

pumps, or internet access could be down or slow. And some emergency planners are concerned a cyber attack combined with a physical act of terrorism (like a "dirty bomb" or releasing a chemical or biological agent) could potentially interfere with response capabilities.

Most countries have agencies committed to securing and monitoring "critical infrastructure" and share information with each other on a regular basis. As we mentioned earlier, the public should stay current on alerts and news relating to national security by visiting the U.S.'s Department of Homeland Security site at www.dhs.gov and Canada's Office of Critical Infrastructure Protection and Emergency Preparedness site at www.ocipep.gc.ca .

BIOLOGICAL AGENTS

Biological agents are actually tiny life forms or germs that can occur naturally in plants, animals and soils or can be developed for scientific or military purposes. Many biological agents affect humans by being inhaled, absorbed into the skin through a cut, or by swallowing contaminated food or water. But there are things that make it difficult for some biological agents to live like sunlight (ultraviolet light) or dry conditions. Wind could carry agents long distances but also spreads it out making it less effective.

Many animals and insects carry diseases that affect humans but most don't make us sick when eaten or inhaled because our immune systems are strong enough to fight them. But, if a person's immune system is weak (like in babies or the elderly), it's possible that person could become sick or die.

What biological agents could be used in an attack?

There are **3 basic groups** of biological agents that could be weaponized and used in an attack (but realize there are some that occur naturally too):

- **Bacteria** - tiny life forms that reproduce by simple division and are easy to grow -- the diseases they spread are killed by a strong or boosted immune system or antibiotics (if necessary)
- **Viruses** - organisms that need living cells to reproduce and are dependent on the body they infect -- most diseases caused by viruses don't respond to antibiotics but sometimes antiviral drugs work (and a boosted immune system may help fight the invading organisms but depends on the type of virus)
- **Toxins** - poisonous substances found in and extracted from living plants, animals or microorganisms; some toxins can be produced or altered -- some toxins can be treated with specific antitoxins and selected drugs

Remember, biological weapons - or germ warfare - have been around since World War I so it's not anything new ... it's unfortunate we have to discuss it at length, but try not to let this topic frighten you. Educate yourselves about the types and where to find more information so you are prepared to react.

How could biological agents be used in an attack?

As mentioned earlier, most biological agents break down when exposed to sunlight or other conditions, and they are very hard to grow and maintain.

There are 3 ways biological agents could be spread:

- **Aerosols** - dispersed or spread into air by a number of methods forming a fine mist that could drift for miles
- **Animals and insects** - some diseases can be carried and spread by critters like birds, mice or rodents, mosquitoes, fleas, or livestock -- a process also known as "agroterrorism"
- **Food and water contamination** - most organisms and toxins are killed or deactivated when we cook food and boil or treat water but some may continue living

Some biological agents could remain in the environment and cause problems long after they are released. But keep in mind, both the Center for Disease Control and Environmental Protection Agency are working closely with various Departments of Defense and Energy and many other agencies around the country to monitor systems and security and develop plans. The same can be said for Health Canada and many Canadian government agencies.

The CDC also suggests citizens not be frightened into thinking they need a gas mask or be concerned about food and water sources. In the event of a public health emergency, local and federal health departments will tell people what actions need to taken.

What are the names of some biological agents and what can they do?

According to the Center for Disease Control's Public Health Emergency Preparedness and Response web site, there are many types of biological diseases and agents - in fact, too many to list here. The CDC has categorized biological agents into 3 groups (A, B and C). The diseases and agents listed in Category A are considered "highest priority" and rarely seen in the United States. Since most of the same agents were also listed on Health Canada's Emergency Preparedness and Response site, we decided to cover 7 specific agents (plus "ricin" from Category B) in alphabetical order.

Anthrax - is an infection caused by bacteria (*Bacillus anthracis*) found naturally in soil where it can live for years. The bacteria form a protective coat around themselves called spores which are very tiny, invisible to the naked eye, and odorless. Anthrax is most common in cows and sheep but can also infect humans (primarily people who work with hoofed animals).

How it spreads: Anthrax cannot spread from person to person. People come into contact with bacteria by breathing in spores (**inhalation**), by getting it through a cut in skin (**cutaneous**) or by eating something containing bacteria - like undercooked meat from an infected animal (**gastrointestinal**).

Signs & Symptoms: Signs depend on type of anthrax you're exposed to:

- Inhalation - most serious form - first signs similar to cold or flu (sore throat, fever and extremely tired but no runny nose) -- after several days may lead to severe breathing problems, shock, then possibly death
- Cutaneous - least serious form - first symptom is a small painless sore that turns into a blister -- a day or two later blister forms a black scab in the center
- Gastrointestinal - at first nausea, loss of appetite, puking, and fever -- followed by severe abdominal pain and diarrhea

Treatment: All three forms of anthrax are treatable with antibiotics. Chances of coming into contact with anthrax are very low, and your body naturally fights off bacteria so you may not even become ill.

Botulism - is a muscle-paralyzing disease caused by a toxin made by a bacterium called *Clostridium botulinum*. *C. botulinum* occurs naturally and can be found in soil, water, animals, contaminated foods or crops. According to Health Canada, the toxin produced by *C. botulinum* is the most potent toxin known and can affect humans, animals and even fish. There is only one form of human-made botulism known to date.

How it spreads: Botulism cannot spread from person to person. People come into contact with the naturally formed bacteria by eating something (**foodborne** - usually due to improper storage or home canning methods), through a cut in the skin (**wound**), or a small number of infants (typically less than a year old) can eat bacterial spores that get into intestines (**infant botulism**). The only human-made form has been known to be transmitted from monkeys to veterinarians or lab workers (**inhalation**).

Signs & Symptoms: Depends on type of botulism you're exposed to and the degree of exposure to the toxin but generally ...

- Foodborne - rare - signs usually appear in 6 to 36 hours
- Wound - first signs usually appear in 4 to 8 days
- Infant botulism - signs usually appear in 6 to 36 hours
- Inhalation - first signs usually appear in 72 hours

Early symptoms for ALL forms of botulism include double vision, blurred vision, drooping eyelids, hard to speak or swallow, dry mouth and fatigue (very tired). Muscle weakness starts at top of body and goes down causing nerve damage that results in paralysis of face, head, throat, chest, arms and legs -- could possibly lead to death since breathing muscles do not work.

Treatment: There is an antitoxin for botulism, but it must be treated as quickly as possible since it may or may not reverse the effects of the disease but can stop further paralysis. Antibiotics are not effective against toxins.

Plague - is caused by a bacterium called *Yersinia pestis* that affects animals and humans. *Y. pestis* is found in rodents and their fleas in many areas of the world, including the U.S. The bacterium is easily killed by sunlight and drying but could live up to an hour when released into the air depending on weather conditions.

How it spreads: There is only one cause of plague but three different types of illness the infection can cause. One type of infection comes from the bite of an infected flea or gets in through a cut in the skin by touching material infected with bacterium (**bubonic**), another can be spread through the air and inhaled (**pneumonic**), and a third type occurs when plague bacteria multiplies in the blood of a person already infected with plague (**septicemic**).

Signs & Symptoms: Plague types may occur separately or in combination with each other ... and all start with fever, headache, weakness, chills (possibly puking and diarrhea) usually within 1 to 10 days of being exposed.

- Bubonic - most common - also develop swollen, tender lymph glands (called buboes). Does not spread from person to person.
- Pneumonic - least common but most deadly -- could be used in attack but hard since sunlight kills it. Also get rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery spittle. May cause respiratory failure, shock or death. Can be spread person to person through air (inhaling droplets from a cough, sneeze, etc.)
- Septicemic - can occur with either bubonic or pneumonic plague due to bacteria multiplying in blood. Also develop abdominal pain, shock, and bleeding into skin and other organs. Does not spread from person to person.

Treatment: There are several antibiotics that can effectively treat plague. (It is very important to get treatment for pneumonic plague within 24 hours of first symptoms to reduce the chance of death).

Ricin - is said to be one of the most toxic natural poisons made very easily from the waste left over from processing castor beans. A castor bean plant is a shrub-like herb with clustered seed pods containing bean-like seeds. Accidental poisoning by ricin is unlikely -- it would have to be a planned act to make and use the toxin as a weapon. Ricin can be in many forms and is not weakened much by extreme hot or cold temperatures. (Ricin is also classed as a "biotoxin" under the CDC's chemical agents' list.)

How it spreads: Ricin cannot be spread person to person. People come into contact with ricin by breathing in a mist or powder spread into the air (**inhalation**), by eating or drinking something containing toxin (**ingestion**), or by having a ricin solution or pellet stuck into the body (**injection**).

It is hard to say how much ricin could kill a person since it depends on how that person was exposed to the toxin. For example, about 500 micrograms (about the size of the head of a pin) could kill a person if injected into the body, but it would take a lot more if inhaled or swallowed. Ricin prevents cells from making proteins they need when toxin gets inside the body. Cells will die without proteins and eventually the entire body shuts down and dies.

Signs & Symptoms: Depends on how much ricin a person is exposed to -- in large amounts death could occur within 36 to 48 hours. If a person lives more than 5 days without problems, there's a good chance they will survive:

- Inhalation - within a few hours of breathing in large amounts of ricin, the first signs are usually coughing, tightness in the chest, hard time breathing, nausea (sick to stomach), and aching muscles. In the next few hours, airways (lungs) would become severely inflamed (swollen and hot), excess fluid would build up in lungs, becomes even harder to breathe, and skin may turn blue
- Ingestion - if a large amount of ricin is swallowed it will cause internal bleeding of the stomach and intestines, leading to puking and bloody diarrhea -- and most likely lead to liver, spleen and kidneys shutting down, and the person could die
- Injection - if enough ricin is injected into a person, it immediately kills muscles and lymph nodes around area where it entered body -- eventually organs would shut down and the person would have massive bleeding from stomach and intestines causing death

Treatment: There is no antidote for ricin exposure. Supportive medical care could be given based on how a person was exposed to ricin (like oxygen or medication to reduce swelling [if inhalation] or I.V. fluids [if ingestion]), but care mainly helps symptoms.

Smallpox - is a very serious, highly contagious and sometimes deadly disease caused by the variola virus. The most common form of smallpox causes raised bumps on the face and body of an infected person. There has not been a case of smallpox in the world since 1977, however in the 1980s all countries consolidated their smallpox stocks in two government-controlled laboratories in the U.S. and Russia. These secured laboratories still have the virus in quantities for research purposes, but it is very possible some vials have gotten or could get into the hands of terrorist groups.

Smallpox disease killed over 300 million people in the 20th century and experts say it is the most dangerous infectious disease ever. There is no cure for smallpox and most patients infected with the disease recover, but death may occur in as many as 3 of every 10 persons infected.

How it spreads: Smallpox is primarily spread person to person through droplets that are inhaled but usually requires close contact. It can also be spread by infected bodily fluids (especially fluid from bumps) or from bed

linens or clothing from an infected person. It is very rare but the virus could carry in the air of an enclosed area like a train or building. Smallpox only infects humans and is not known to be transmitted by insects or animals.

Someone carrying the virus may not even know they have it since it lies dormant (incubation period) for up to 17 days. A person with smallpox is most contagious from the time the rash starts until the last scab falls off (usually about 1 month). Anyone face-to-face with an infected person (within 6 - 7 feet / 2 meters) will most likely get the virus by inhaling droplets or dried fluids or by touching infected materials.

Signs & Symptoms: According to the CDC, exposure to the smallpox virus has an incubation period of 7 to 17 days (average is 12 to 14 days) where people feel fine, show no symptoms and are not contagious, then...

- Prodrome phase - first symptoms of smallpox include fever, weird or uneasy feeling (malaise), head and body aches, and sometimes puking. Fever may be high (between 101F-104F or 38C-40C) -- may be contagious. Phase can last 2 - 4 days.
- Spotty mouth - small red spots appear on the tongue and in the mouth (this is start of the "early rash phase")
- Spots become sores - spots turn into sores that break open and spread large amounts of the virus into the mouth and throat -- person is VERY contagious at this point!
- Rash - as sores in mouth break down, a rash starts on the face and spreads to arms and legs, then hands and feet -- usually takes about 24 hours to cover body. As the rash appears, fever drops, and person may feel a little better.
- Raised bumps - by third day, rash turns into raised bumps
- Bumps fill up - by fourth day, bumps fill with a thick, clear fluid -- each bump has a dent in the center (like a bellybutton)
- Bumps become pustules - fever returns and bumps become pustules (which is a raised bump, usually round, firm and feels like there's something hard inside - like a BB pellet) -- lasts about 5 days
- Pustules become scabs - fever still high, next the pustules form a crust turning into scabs - lasts about 5 days -- about 2 weeks after rash first appears most of the sores will be scabbed over
- Scabs fall off - takes about 6 days for all the scabs to fall off leaving a scar or dent in the skin where each scab was (most are gone about 3 weeks after early rash first appears). Person is no longer contagious when all scabs have fallen off.

Treatment: There is no cure or treatment for smallpox. A vaccination within 4 days of being exposed could help stop disease but, if vaccinated years ago, it's doubtful you'd be protected now. Many countries are stockpiling vaccine and considering vaccinations for all citizens, but many experts feel

that may not be necessary yet. There are certain people who should not get the vaccine. If you do decide to take vaccination, boost your immune system before getting shots since it may help your body fight any adverse reactions.

*If you have concerns or questions about **smallpox**, you should visit the CDC's Public Health Emergency Preparedness and Response web site at www.bt.cdc.gov/agent/smallpox or Health Canada's Emergency Preparedness and Response site at www.hc-sc.gc.ca/english/epr/smallpox.html*

Tularemia - (also known as "rabbit fever") is a disease caused by a strong bacterium, *Francisella tularensis*, found in wild animals and some insects (especially rabbits, hares, beavers and other rodents, mosquitoes, deerflys or ticks) and found in soil, water sources and vegetation in those critters' habitats. *F. tularensis* is one of the most infectious bacteria known and it doesn't take much to cause the disease. Tularemia has been considered useful as an airborne weapon worldwide since the 1930s which is why there's valid concern it could be used today in a terrorist attack.

How it spreads: Tularemia is not known to spread person to person. Some wild animals carry the disease - usually because they were bitten by an infected bug or drank or ate from contaminated water or soil. Hunters and people who spend a lot of time outdoors can get the disease from critters through a bite or handling a diseased carcass (**skin**), from eating an infected animal not properly cooked or by drinking untreated, contaminated water (**stomach**), or from breathing in dust from contaminated soil (**lungs**).

Signs & Symptoms: Depends on how a person is exposed to tularemia and all symptoms may not occur -- all 3 usually appear in 3 to 5 days (but could take up to 14 days) ... may include fever, chills, joint pain, weakness, and ...

- Skin - may also include a bump or ulcers on bite, swollen and painful lymph glands
- Stomach - may also include sore throat, abdominal pain, ulcers on or in mouth, diarrhea or puking
- Lungs - may also include dry cough, chest pain, bloody spittle, trouble breathing or stops breathing

Treatment: Tularemia can be treated with antibiotics but people exposed to *F. tularensis* should be treated as soon as possible since it could be deadly.

Viral hemorrhagic [hem-er-á-jik] **fevers (VHFs)** - are a group of diseases or illnesses caused by several families of viruses. There are many types of VHFs - some the public may recognize are Ebola, Marburg or hantavirus. Some VHFs cause mild reactions or illnesses while others are deadly. Most VHFs are highly contagious and associated with bleeding (hemorrhage), but that's usually not life-threatening. In severe cases, the overall vascular - or blood vessel - system is damaged so the body can't regulate itself thus causing organs to shut down.

Viral hemorrhagic fevers (VHFs) are quite an extensive and complex topic so we are only mentioning it here since it's on the CDC's Category A list. Both the CDC and Health Canada cover VHFs at length on their web sites (listed below) if you would like to learn more. We're just briefly explaining how it can spread and listing some general signs and symptoms in the event you ever hear about "viral hemorrhagic fevers" in the news.

How it spreads: Most viruses associated with VHFs naturally reside in animals (mice, rats or other rodents) or insects (ticks or mosquitoes). Some VHF viruses could spread to humans by the bite of an infected insect or by breathing in or touching an infected animal's pee, poop, or other body fluids. (For example, a person crawling in a rat-infested area could stir up and breathe in a virus, or someone slaughtering livestock infected by an insect bite could also spread the virus.) Some other VHF viruses spread person to person through direct, close contact with an infected person's body fluids.

Signs & Symptoms: Signs vary by the type of VHF, but the first symptoms often include sudden fever, fatigue (very tired), dizziness, weakness and headache. Person could also have a sore throat, abdominal pain, puking, and diarrhea. Severe cases often show signs of bleeding under the skin, in internal organs, or from the mouth, eyes, or ears. Blood loss is rarely the cause of death and is usually followed by collapse, shock, coma, seizures and organ failure (the body just shuts down).

Treatment: There is no specific cure or vaccine for most VHFs. Hospitalization and supportive medical care could be given in strict isolation to prevent the virus from spreading to others, but care mainly helps symptoms. Keeping rodents and mosquitoes out of your home is good prevention.

Before a Biological Attack:

If you skipped the last several pages discussing some BIOLOGICAL agents, you may want to review them along with the following BEFORE, DURING and AFTER tips developed by FEMA and the Department of Homeland Security.

Watch & listen for signs - Many biological agents do not give immediate "warning signs" -- and most symptoms show up hours or days later so it's hard to say what to watch for, but learn about some common agents (see previous pages) and stay current by listening to radio and TV reports to hear what local authorities tell people to do -- and DO it!

Report strange things - Be aware of your surroundings -- watch for strange or suspicious packages ... or spray trucks or crop dusters in weird places at strange times ... and report suspicious activities to local authorities.

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Get rid of pests - Keep home clean and put food away that might attract rats or mice and get rid of "standing water" sources around yard (like buckets, tires, pots, or kiddie pools) since they are breeding grounds for mosquitoes.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Biological Attack:

During any type of biological attack, local authorities will instruct the public about where to go and exactly what to do if exposed to an agent (which may require immediate attention with professional medical staff). It's possible there may be signs (as seen with the anthrax mailings), but more likely it would be discovered after the fact when local health care workers have a wave of sick people seeking emergency medical attention or there are reports of unusual illnesses or symptoms.

Don't panic -- Listen - Stay calm and listen to radio, TV and officials to ...

- Determine if your area is in danger or if you were in the area when it was contaminated.
- Learn signs and symptoms of agent or disease (see previous pages briefly describing **anthrax**, **botulism**, **plague**, **ricin**, **smallpox**, **tulermia**, and **viral hemorrhagic fevers** [**VHFs** - like Ebola or Marburg]).
- Find out if medications or vaccines are being distributed by authorities and, if so, where can you get them.

Cover up - Cover your mouth and nose with layers of fabric to filter air but still let you breathe (like 2-3 layers of cotton T-shirt or towel or several layers of paper towel, napkins or tissues).

Clean up - Wash with soap and water to keep from spreading germs.

Stay away - Get away from the attack site to avoid contamination.

Evacuate...? - If you are told to evacuate… DO it! If officials say you have time, close windows, shut vents and turn off attic fans. *(see EVACUATION)*

Things to avoid:

- **powder** - strange white powdery substance (anthrax)
- **aerosol mists** - could drift for miles but may be hard to see
- **contaminated food or water** - don't eat or drink any food or water that may have been exposed to agents

Feel sick...? - Many symptoms from biological agents take time to show up so watch family members for signs of illness.

After a Biological Attack:

Don't panic -- Listen - Stay calm and listen to radio, TV and officials to ...

- Determine if your area is or was in danger.
- Learn signs and symptoms of agent or disease.
- Find out if medications or vaccines are being distributed by authorities and, if so, where you can get them.

Feel sick...? - In most cases, people won't be aware they have been exposed to an agent -- some cause immediate symptoms but many take a while to show up so keep watching for signs of illness.

Don't go there - Do not return home until local authorities say it is safe.

Don't spread it - A person, critter, or item that has been exposed to a disease or biological agent may spread it so...

- **clean up** - if your skin or clothing comes in contact with a suspected visible powder or liquid, wash with soap and water to keep from spreading germs
- **store clothes & shoes** - put exposed clothing and shoes in tightly sealed containers without touching other materials and call local authorities to ask how to get rid of them
- **strange symptoms** - if unusual symptoms show up, get to a hospital or medical expert right away!
- **tell people you've been exposed** - tell everyone who comes in contact with you that you may have been exposed to a biological agent
- **land and property** - ask local authorities how to clean up (or ask if it's even necessary)

*For more information about **biological agents**, please visit the Center for Disease Control's Public Health Emergency Preparedness and Response web site at www.bt.cdc.gov or Health Canada's Emergency Preparedness and Response web site at www.hc-sc.gc.ca/english/epr or call the CDC Public Response Hotline at 1-888-246-2675 or 1-888-246-2857 (Español) or 1-866-874-2646 (TTY).*

CHEMICAL AGENTS

Chemical agents are poisonous vapors (gas), sprays (aerosols), liquids or solids that can poison people, animals and the environment. Some agents or

compounds do have industrial uses, but many are man-made substances designed, developed and stockpiled as military weapons around the world.

Most chemical agents are difficult to produce and very hard to deliver in large quantities since they scatter so quickly. Most are liquids and some may be odorless and tasteless. They could be inhaled, absorbed into the skin, or swallowed from a contaminated food or water source. Chemical agents can take effect immediately or over several hours or days - and can be deadly if exposed to enough of the agent. If exposed, the best thing you can do is distance yourself from the agent and area and get fresh air.

What chemical agents could be used in an attack?

According to the CDC, there are several **categories** of chemical agents that could potentially be used in a terrorist attack - some common ones include:

- **Blister Agents / Vesicants** (Sulfur Mustard / Mustard Gas or Lewisite) - primarily cause blisters but can also damage eyes, airways, and digestive system
- **Blood Agents** (Arsine or Cyanide) - gets into the blood stream and prevents cells from absorbing oxygen so cells die
- **Choking / Lung / Pulmonary Agents** (Ammonia or Chlorine) - cause breathing problems and lack of oxygen damages organs
- **Incapacitating Agents** (BZ or LSD) - disrupts central nervous system (knocks you out), causes confusion and slows breathing
- **Nerve Agents** (Sarin, Soman, Tabun or VX) - the most toxic agents -- basically turns "off" the body's ability to stop muscles and glands from twitching (body goes into convulsions). Most agents were originally developed as pesticides / insecticides.

Some other categories include ... **Biotoxins** (like Abrin or Ricin), **Caustics** (Hydrofluoric Acid), **Metals** (Arsenic or Mercury), **Organic Solvents** (Benzene), **Riot Control Agents / Tear Gas** (CS or CN), **Toxic Alcohols** (Ethylene Glycol), and **Vomiting Agents** (Adamsite).

Remember, chemical weapons - or chemical warfare - have been around since World War I ... it's unfortunate we have to even discuss it but try not to let this topic frighten you. As we stated earlier, educate yourselves about the types and where to find more information so you are prepared to react in the event of a chemical threat or attack.

How could chemical agents be used in an attack?

There are several ways chemical agents could be spread:

- **Vapors / Gas / Aerosols** - spread into the air by a bomb or from aircraft, boats or vehicles -- could spread for miles
- **Liquids** - could be released into the air, water or soil or touched by people or animals
- **Solids** - could be absorbed into water, soil or touched

Some chemical agents can remain in the environment and cause problems long after they are released. Again, keep in mind, both the Center for Disease Control and Environmental Protection Agency are working closely with various Departments of Defense and Energy and many officials around the country to monitor systems and security and develop plans. The same can be said for Health Canada and many other Canadian government agencies.

Again, the CDC asks citizens to not be frightened into thinking they need a gas mask or be concerned about water or food sources. In the event of a public health emergency, officials will tell people what actions need to be taken.

What are the names of some chemical agents and what can they do?

According to the Center for Disease Control's Public Health Emergency Preparedness and Response web site, there are many types of chemical agents - again too many to list here. We're only mentioning several common agents in alphabetical order, but realize there are many others we are not covering that could potentially be used. Always listen to authorities for instructions in the event of a chemical threat or attack.

BZ (**Incapacitating**) - and other stun agents (LSD, etc.) disrupt the central nervous system causing confusion, short-term memory loss and immobility (means you can't move or are incapacitated).

How it spreads: BZ could be released by a bomb or sprayed into the air as an aerosol but has been proven unpredictable if used outdoors.

Signs & Symptoms: Depends on how person is exposed to BZ and varies by person -- basically it screws with your nervous system causing confusion, dream-like feelings or strange visions (called hallucinations), dilation of the pupils (means pupils bigger than normal), slurred speech, and loss of motor skills (you can't move). It can also slow down breathing and heart rate.

Treatment: BZ is treated with an antidote that reverses symptoms for about an hour. May need repeated doses since the effects can last for hours or days.

Chlorine (**Choking / Lung / Pulmonary**) - is used in industry (to bleach paper or cloth), in water (to kill germs), and in household products. Chlorine can be in the form of a poisonous gas or the gas can be pressurized and cooled into a liquid. When gas comes in contact with moist tissues (eyes, throat, or lungs), an acid is produced that can damage these tissues. Chlorine is not flammable but reacts explosively if mixed with certain liquids.

How it spreads: Chlorine could be released into water, food or air. People can be exposed by drinking or eating something contaminated with excess amounts of chlorine or by inhaling the poisonous gas. Chlorine gas is yellow-green, smells like bleach, and stays close to the ground as it spreads.

Signs & Symptoms: Depends on how much and how exposed but signs may show up during or right after exposure to dangerous amounts of chlorine:

- Skin - *if gas:* burning pain, redness, and blisters
  if liquid: skin white or waxy, numbness, blisters (like frostbite)
- Eyes - burning feeling, blurred vision, watery eyes
- Nose, throat & lungs (respiratory tract) - burning feeling in nose and throat, tightness in chest, coughing, hard time breathing or shortness of breath, fluid builds up in lungs within 2 to 4 hours
- Stomach/gastrointestinal: puking, nausea (sick to stomach)

Treatment: - There is no antidote for chlorine exposure -- main things are to remove it from body and seek medical attention as soon as possible.

- First - leave area as quickly as possible
  ... if outdoors - get to high ground (avoid low-lying areas)
  ... if in building - get outside to high ground and upwind
- If inhaled - get fresh air as quickly and calmly as possible
- If on clothing or skin - remove clothes and shoes that are contaminated but don't pull anything over head - cut it off body. If possible, seal clothing in plastic bag, then seal that bag in a bag. Immediately wash body with clean water and soap.
- If in eyes - remove contacts and put in bags with clothing - do not put back in eyes! If eyes burning or vision blurred, rinse eyes with plain water for 10 to 15 minutes. If wearing glasses, wash them with soap and water before putting back on.
- If swallowed - if someone drinks or eats something exposed to chlorine, do NOT make them puke or drink fluids - call 9-1-1

Ask officials how to dispose of bags with contaminated clothing, shoes, etc.

Cyanide (**Blood**) - is a very fast acting and potentially deadly chemical that exists in several forms. The CDC categorizes cyanide as "blood" agents but sometimes called "cyanide or cynogen" agents. Cyanide can be a colorless gas (cyanogen chloride or hydrogen cyanide) or a crystal solid form (like potassium or sodium cyanide). It may smell like "bitter almonds" but most often is odorless. Cyanide is naturally present in some foods or plants - it's also in cigarette smoke or given off when some plastics burn. It is also used to make paper or textiles and in chemicals used to develop photos.

How it spreads: Cyanide could enter water, soil or air as a result of natural or industrial processes or can also be spread indoors or outdoors as a weapon. People can be exposed by breathing gas or vapors or cigarette smoke, by drinking or eating something contaminated (either accidently or on purpose) or by touching soil or clothing that was exposed to cyanide. Cyanide gas disappears quickly and rises since less dense than air so pretty useless outdoors.

Signs & Symptoms: Basically cyanide prevents the cells from absorbing oxygen so cells die. No matter how exposed (breathing, absorbed through skin, or eating / drinking) some or all signs show up within minutes:

- Exposed to small amount - rapid breathing, gasping for air, dizziness, weakness, headache, nausea (sick to stomach), puking, restlessness, rapid heart rate, bluish skin or lips (due to lack of oxygen in blood)
- Large amount - above signs plus convulsions, low blood pressure, slow heart rate, pass out, lung injury, stops breathing leading to death. Survivors of serious poisoning may develop heart and brain damage due to lack of oxygen.

Treatment: Cyanide poisoning is treated with antidotes and supportive medical care (mainly to help symptoms). The main things are to avoid area where it was released and seek medical attention as soon as possible.

- First - leave area as quickly as possible
  ... if outdoors - move upwind or stay low to ground (gas rises)
  ... if in building - get outside and get upwind
- If inhaled - get fresh air as quickly and calmly as possible
- If on clothing or skin - remove clothes and shoes that are contaminated. Seal clothing in plastic bag then seal that bag in a bag - ask how to dispose of bags. Immediately wash any exposed body parts (skin & hair) with clean water and soap.
- If in eyes - remove contacts if necessary. If eyes are burning or vision blurred, rinse eyes with plain water for 10 to 15 minutes.
- If swallowed - if someone drinks or eats something exposed to cyanide, do NOT make them puke or drink fluids - call 9-1-1

Sarin (**Nerve**) - is a clear, colorless, odorless and tasteless liquid that could evaporate into a vapor (gas) and contaminate the environment. It is man-made and originally developed to kill insects. Nerve agents basically turn "off" the body's ability to stop muscles and glands from twitching.

How it spreads: Sarin could be released into the air, water, or soil as a weapon. People can be exposed by breathing vapors, by drinking or eating something contaminated, or by touching soil or clothing exposed to sarin. A person's clothing can release sarin for about 30 minutes after being exposed to vapor. Because sarin is heavier than air, it settles in low-lying areas but evaporates quickly so is a short-lived threat.

Signs & Symptoms: Depends on how much, what form, and how people are exposed to sarin. No matter how exposed (breathing, absorbed through skin, or eating / drinking it), the following may show up within seconds (vapor or gas) or within minutes to 18 hours (liquid)...

- Head - runny nose, drooling or excess spittle, headache
- Eyes - watery, small pupils, blurred vision, eye pain

- Lungs - cough, tight feeling in chest, fast / rapid breathing
- Nervous system - confusion, drowsiness, weakness
- Heart/blood - slow/fast heart rate, rise/drop in blood pressure
- Stomach/gastrointestinal - abdominal pain, puking, nausea (sick to stomach), diarrhea, pee lot more than normal

... plus ...

- If exposed to small amount - just a drop of sarin on skin can cause sweating and muscle twitching
- If large amount - can cause convulsions (body can't stop the muscles and glands from twitching), paralysis (can't move), pass out, stops breathing leading to death

Treatment: Sarin poisoning is treated with antidotes and supportive medical care. Main things are to avoid area where released, get decontaminated (strip & wash), and seek medical attention as soon as possible.

- First - leave area as quickly as possible
  ... if outdoors - move to higher ground and stay upwind
  ... if in building - get outside to highest ground possible
- If inhaled - get fresh air as quickly and calmly as possible
- If on clothing or skin - remove clothes and shoes that are contaminated but don't pull anything over head - cut it off body. Seal all in plastic bag, then seal that bag in a bag and ask how to dispose of. Immediately wash body with clean water and soap.
- If in eyes - remove contacts if necessary. If eyes burning or vision blurred, rinse eyes with plain water for 10 to 15 minutes.
- If swallowed - if someone drinks or eats something exposed to sarin, do NOT make them puke or drink fluids - call 9-1-1

Sulfur Mustard / Mustard gas (**Blister/Vesicant**) - (also known as "mustard agent") can be in the form of a vapor, a liquid or a solid. The liquid has an oily texture and can be clear to yellow or brown in liquid or solid form. It is not normally found in the environment, however, if released, can last for weeks or months under very cold conditions. Under normal weather conditions, it usually only lasts a day or two.

Mustard gas is fairly easy to develop so many countries that decide to have chemical warfare agents usually stock up on this one. Sulfur mustard was originally produced in the 1800's but first used as chemical warfare in World War I and in many wars since. Exposure to sulfur mustard is usually not fatal but could have long-term health effects.

How it spreads: Sulfur mustard / mustard gas can be released into the air as a vapor or gas and enter a person's body by breathing or get on skin or in eyes. The vapor would be carried for long distances by wind so the agent could affect a wide area. Sulfur mustard is heavier than air so vapors will

settle in low-lying areas. A liquid or solid form could be released into water and a person could be exposed by drinking it or absorbing it through the skin. Since it often has no smell or the smell doesn't raise a red flag (can smell like garlic, onions or mustard), people may not realize they have been exposed.

Signs & Symptoms: Depends on how much, what form, and how a person is exposed to sulfur mustard / mustard gas and may not occur for 2 to 24 hours ... some immediate signs include...

- Skin - redness and itching of skin may occur 2 to 48 hours after exposure -- changes to yellow blistering of skin
- Eyes - a mild case causes irritation, pain, swelling and watery eyes within 3 to 12 hours -- a more severe case causes same within 1 to 2 hours - may also include light sensitivity, severe pain or temporary blindness (lasting up to 10 days)
- Nose & lungs (respiratory tract) - runny nose, sneezing, sinus pain, bloody nose, short of breath, may get hoarse, and cough (mild exposure shows within 12 to 24 hours -- severe shows within 2 to 4 hours)
- Digestive tract - abdominal pain, nausea (sick to stomach), diarrhea, puking, and fever

Some long-term health effects may include ...

- Burns or scarring - exposure to sulfur mustard liquid (not gas) may produce second- and third-degree burns and later scarring
- Breathing problems or disease - severe exposure could cause chronic respiratory disease, repeated infections, or death
- Blindness - severe exposure can cause permanent blindness
- Cancer - may increase chance of lung or respiratory cancer

Treatment: There is no antidote for sulfur mustard / mustard gas exposure - the best thing to do is avoid it by leaving the area where it was released.

- First - leave area as quickly as possible
  ... if outdoors - move upwind and get to higher ground
  ... if in building - get outside, upwind and to higher ground
- If inhaled - get fresh air as quickly and calmly as possible
- If on clothing or skin - remove everything that got contaminated. Seal clothing and shoes in plastic bag, then seal that bag in a bag - ask how to dispose of later. Immediately wash exposed body parts (eyes, skin, hair, etc.) with plain, clean water.
- If in eyes - remove contacts if necessary. Flush eyes with water for 5 to 10 minutes but do NOT cover eyes with bandages - put on shades or goggles to protect them.
- If swallowed - if someone drinks or eats something contaminated with sulfur mustard, do NOT make them puke it up -- give the person some milk to drink and call 9-1-1

VX (**Nerve**) - is an oily liquid that is odorless, tasteless, amber or honey-yellow in color, and evaporates about as slowly as motor oil. VX is the most potent of all nerve agents, which basically turn "off" the body's ability to stop muscles and glands from twitching. Like other nerve agents, VX is a man-made chemical originally developed to kill insects and pests.

How it spreads: VX could be released into the air or water as a weapon, however it does not mix with water as well as other nerve agents. If VX gas or vapors are released into the air, people can be exposed by breathing or eye or skin contact and a person's clothing can release VX for about 30 minutes after being exposed. If VX liquid is put in food or water source, people could get it from eating, drinking or touching something exposed to the liquid.

VX vapor is heavier than air so settles in low-lying areas. Under average weather conditions, VX can last for days on objects that come in contact with the agent, but in cold weather it could last for months. The liquid takes time to evaporate into a vapor so could be a long-term threat to the environment.

Signs & Symptoms: VX is similar to sarin - depends on how much, what form, and how people are exposed. No matter how exposed (breathing, absorbed through skin, or eating / drinking it) the following may show up within seconds to hours ...

- Head - runny nose, drooling or excess spittle, headache
- Eyes - watery, small pupils, blurred vision, eye pain
- Lungs - cough, tight feeling in chest, fast / rapid breathing
- Nervous system - confusion, drowsiness, weakness
- Heart/blood - slow or fast heart rate, rise or drop in blood pressure
- Stomach/gastrointestinal - abdominal pain, puking, nausea (sick to stomach), diarrhea, pee more than normal

... plus ...

- If exposed to small amount - a tiny drop of VX on skin can cause sweating and muscle twitching
- If large amount - can cause convulsions (body can't stop the muscles and glands from twitching), paralysis (can't move), may pass out, stops breathing leading to death

Treatment: VX poisoning can be treated with antidotes but must be given shortly after exposure to be effective. The main things are avoid area where agent was released, get decontaminated (strip & wash), and seek medical care as soon as possible.

- First - leave area as quickly as possible
  ... if outdoors - move to higher ground and stay upwind
  ... if in building - get outside to highest ground possible
- If inhaled - get fresh air as quickly and calmly as possible

- If on clothing or skin - remove clothes and shoes contaminated with VX but don't pull anything over head - cut it off body. Seal all in plastic bag, then seal that bag in a bag and ask how to dispose of. Immediately wash body with clean water and soap.
- If in eyes - remove contacts if necessary. If eyes burning or vision blurred, rinse eyes with plain water for 10 to 15 minutes.
- If swallowed - if someone drinks or eats something exposed to VX, do NOT make them puke or drink fluids - call 9-1-1

Before a Chemical Attack:

If you skipped the last several pages discussing some CHEMICAL agents, you may want to review them, along with the below BEFORE, DURING and AFTER tips developed by FEMA and the Department of Homeland Security. You may also want to review the HAZARDOUS MATERIALS topic.

Watch & listen for signs - Many chemical agents can cause watery eyes, choking, trouble breathing, coughing or twitching. If you see or hear a lot of people doing this or see a bunch of birds, fish or small animals sick or dead, it should raise a red flag. Learn about some common potentially hazardous chemical agents (see previous pages) and stay current by listening to radio and TV to hear what local authorities tell people to do -- and DO it!

Report strange things - Be aware of your surroundings -- watch for strange or suspicious packages ... or spray trucks or crop dusters in weird places at strange times ... and report suspicious activities to local authorities.

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**. Some key items include a battery-powered radio (with extra batteries), food and drinking water, duct tape, plastic and scissors, first aid kit, and sanitation items (soap, extra water and bleach).

Pick a room - It could take authorities time to determine what (if any) agent was used so pick a room in advance your family could use if told to stay indoors for several hours. It's best to pick an internal room where you could block out air IF told to do so. To save time consider measuring and cutting plastic sheets in advance for openings (vents, windows, and doors). Remember, a toilet may be vented meaning outside air comes in constantly or when flushed (depends on design) - in case using bathroom as a safe room.

Calculate air for room - Keep in mind people can stay in a sealed off room for only so long (or you'll run out of air!) FEMA suggests 10 square feet of floor space per person (like 5ft x 2ft / 1.5m x 0.6m) will provide enough air to prevent carbon dioxide buildup for up to 5 hours.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Chemical Attack:

During any type of chemical attack, local authorities will instruct the public on where to go and exactly what to do if exposed to an agent (which may require immediate attention with professional medical staff).

Watch for signs - If you see or hear a lot of people choking, coughing or twitching or see a bunch of sick or dead critters - leave area quickly!

Don't panic -- Listen - Stay calm and listen to radio, TV and officials to ...

- Determine if your area is or was in danger.
- Learn signs and symptoms of some agents (see previous pages briefly describing **BZ**, **chlorine, cyanide, sarin, sulfur mustard / mustard gas**, and **VX**).
- Find out if and where antidotes are being distributed.

IF INDOORS – Stay inside and ...

- Close your windows, vents and fireplace damper and turn off A/C and fans to reduce air drawn in from outside.
- Seal gaps under doorways and windows with wet towels, plastic (if available) and duct tape.
- If you picked a safe room in advance, grab your **Disaster Supplies Kit** and seal off that room - remember, you can only stay there for so many hours or you'll run out of air.

IF OUTDOORS - Stay upwind from the disaster area since many agents can be carried by wind. Try to find a shelter as quickly as possible!

IF IN A VEHICLE - Close your windows and shut off vents to reduce risk and drive away and upwind from the attack site, if possible.

Cover up - Cover your mouth and nose with layers of fabric to filter air but still let you breathe (like 2-3 layers of cotton T-shirt or towel or several layers of paper towel, napkins or tissues).

Feel sick...? - Some agents can cause immediate symptoms and some take a while to show up so watch family members for signs of illness.

Evacuate...? - If you are told to evacuate… DO it! If officials say you have time, close windows, shut vents and turn off attic fans. *(see EVACUATION)*

Things to avoid:

- **chemicals** - spilled liquid materials or vapors or gas
- **contaminated food or water** - don't eat or drink any food or water that may have been exposed to materials

Stay away - Get away from the attack site to avoid contamination.

After a Chemical Attack:

Feel sick...? - In some cases, people won't be aware they have been exposed to an agent -- most cause immediate symptoms and some take a while to show up so continue watching for signs of illness.

Don't panic -- Listen - Stay calm and listen to radio, TV and officials to ...

- Determine if your area is or was in danger.
- Learn signs and symptoms of chemical agent.
- Find out if antidotes are being distributed by authorities and, if so, where can you get them.

Don't go there - Don't return home until local authorities say it is safe.

Air out - Open windows, vents and turn on fans in your home.

Clean up - A person, critter or item that has been exposed could spread it...

- **decontamination** - follow instructions from local authorities since it depends on the chemical. May need to shower with or without soap or may be told to avoid water - check first!
- **strange symptoms** - if unusual symptoms show up, get to a hospital or medical expert right away!
- **store clothes & shoes** - put exposed clothing and shoes in tightly sealed containers without touching other materials and call local authorities to ask how to get rid of them
- **tell people you've been exposed** - tell everyone who comes in contact with you that you may have been exposed to a chemical agent
- **land and property** - ask local authorities how to clean it up

Strange vapors or danger - Report any strange vapors or other dangers to the local authorities immediately.

*For more information about **chemical agents**, please visit the Center for Disease Control's Public Health Emergency Preparedness and Response web site at www.bt.cdc.gov or call the CDC's Public Response Hotline at 1-888-246-2675 or 1-888-246-2857 (Español) or 1-866-874-2646 (TTY).*

RADIOLOGICAL THREAT OR DEVICE

Due to the heightened threat of terrorist attacks using a "dirty bomb", we are briefly covering it here. In most cases, terrorist attacks would not involve a

nuclear device (like a "dirty nuke" or missile) since they require weapons grade uranium or plutonium which are very difficult to obtain and develop, but listen for alerts and advisories from officials.

Please note, we already covered nuclear accidents and what to do BEFORE, DURING or AFTER a nuclear-related incident (see pages 74-78).

What is a "dirty bomb"?

A radiological dispersion device (**RDD**) - also known as a "dirty bomb" - uses conventional explosives (like dynamite) to spread radioactive materials in the form of powder or pellets over a targeted area.

This type of attack appeals to terrorists since it doesn't require a lot of technical know-how to build and use ... plus low-level radioactive materials are pretty easy to obtain since they are used in many fields like agriculture, research and medicine.

The most harmful, high-level radioactive materials would be found in nuclear power plants and at nuclear weapons sites, but with the heightened state of alert at many of these locations, it'd be very dangerous and difficult for terrorist organizations to get them.

What are the dangers of an RDD ("dirty bomb")?

A terrorist's main reasons for using a "dirty bomb" is to cause damage to buildings, contaminate an area, and spread fear or panic.

According to the Center for Disease Control, the primary danger from a dirty bomb would be the blast itself - not necessarily the radiation. Knowing how much (if any) radiation might be present at the attack site is difficult when the source of the radiation is unknown until site is tested. However, since many RDDs could be using low-level radioactive materials, there probably would not be enough radiation to cause severe illness.

Has anyone used a "dirty bomb" before?

According to a United Nations report, Iraq tested a dirty bomb device in 1987 but found the radiation levels were too low to cause significant damage. Thus, Iraq abandoned any further use of the device.[5]

What if you or your office receives a "bomb threat"?

Bomb threats are usually received by a telephone call or in the mail. It is highly unlikely a terrorist organization using a "dirty bomb" would give anyone advance warning or call with a bomb threat, however, in the event you or someone in your office receives a bomb threat, do the following...

- If you ever receive a bomb threat, get as much information from the caller as possible.

- Try to keep caller on the phone as long as you can and write down everything that is said! (Since you'll be nervous or scared, good notes will be very helpful to officials later!)
- Notify the police and building management.
- Calmly evacuate the building, keep the sidewalks clear and stay away from windows.

What if you or someone in your office receives a "suspicious package"?

According to the United States Postal Service, the likelihood of you ever receiving a bomb in the mail is remote. Unfortunately, there have been a small number of explosive devices and biological agents that have surfaced in the mail over the years. Some possible motives for an individual or group sending a "suspicious package" include revenge, extortion, love triangles, terrorism, and business disputes.

The following are some unique signs or characteristics from the U.S. Postal Inspection Service that may help identify a "suspect" piece of mail ...

- Package may have restricted markings like "Personal" or "Private" to one who doesn't receive personal mail at office.
- Package is sealed with excessive amounts of tape or has way too much postage on it.
- Postmark city different than Return Address city.
- Misspelled words, written badly or done with letters cut from newspaper or magazine and pasted on.
- Package has wires or aluminum foil sticking out, oil stains, smells weird or sounds funny (sloshing noise).
- Package may feel strange or look uneven or lopsided.

If you are unsure about a letter or package and are not able to verify the Sender or contents with the person it is addressed to then...

- DO NOT open it, shake it, bump it or sniff it!
- Cover the letter or package with a shirt, trash can or whatever is handy.
- Evacuate the area quickly and calmly.
- Wash your hands with lots of soap and water.
- Call building security, police and your postal inspector.
- List all the people who were near the package or letter in case they are needed for further questioning.

Before a Radiological Threat or Event:

Make a plan - Review Section 1 and check on emergency plans for schools, day cares, nursing homes, etc. and where everyone goes when / if evacuated.

Be ready to evacuate - Listen to authorities -- if told to leave - DO it!

Learn about radiation - Please review pages 74-78 since a nuclear-related incident is a similar situation.

During a Radiological Event or Explosion:

Don't panic... - Get out of the area as quickly and calmly as possible!

Don't look... - Do NOT look directly at explosion, flash, blast or fireball!

Things to watch out for:

- **falling objects** - if things are falling off bookshelves or from the ceiling, get under a sturdy table or desk
- **fire** - stay low to the floor (crawl or walk like a duck)
  - only use the stairs (don't use elevators)
  - Check doors before opening with back of hand (If HOT, do NOT open - find another exit!)
- **weak floors or stairs** - be careful since floors and stairs could have been weakened by the blast

Cover up - Cover your mouth and nose with layers of fabric to filter air but still let you breathe (like shirt, paper towel, napkins or tissues).

EMP...? - Blast could create an electromagnetic pulse (zap) that can fry electronics connected to wires or antennas like cell phones, computers, cars, etc.

After a Radiological Event or Explosion:

If you are trapped in an area:

- **light** - use flashlight – never use matches or lighters in case there are gas leaks
- **be still** - try to stay still so you won't kick up dust
- **breathing** - cover your mouth with a piece of clothing
- **make noise** - tap on a pipe or wall so rescuers can hear you (shout only as a last resort -- you could inhale too much dust)

Get distance & shielding - Get out of area quickly and into nearest building to reduce chances of being exposed to radioactive materials (if any).

Rescuing others - Untrained persons should not try to rescue people who are inside a collapsed building… wait for emergency personnel to arrive – then, IF they need you, they will ask.

If radioactive materials were possibly present:

Don't panic -- Listen - Stay calm and listen to radio, TV and officials to ...

- Determine if your area is in danger.
- Find out where to go for radiation monitoring and blood tests to determine if exposed and what to do to protect health.
- Learn if **KI** (potassium iodide) is being passed out by authorities and, if so, find out where to get tablets... or ask if you should take them (if in your **Disaster Supplies Kit**).

Will I get radiation sickness or cancer...? - In most cases, people won't be aware they have been exposed since radiation cannot be seen, smelled, felt, or tasted. Just because you were at the site of a dirty bomb does not mean you were exposed to radioactive material. Until doctors are able to check skin with sensitive radiation detection devices or run blood tests to determine there was any radiation - no one really knows if they were exposed. And even if you were exposed to small amounts of radioactive material, it does not mean you will be sick or get cancer. Listen to and work with medical health professionals since it depends on each specific situation or incident.

For the CDC's information on "acute radiation syndrome" (radiation sickness) visit www.bt.cdc.gov/radiation/ars.asp

*For more information about **radiological emergencies** or **radiation emergencies**, please visit the Center for Disease Control's Public Health Emergency Preparedness and Response web site at www.bt.cdc.gov or visit Health Canada's Nuclear Emergency Preparedness and Response Division at www.hc-sc.gc.ca/hecs-sesc/neprd*

WEAPONS OF MASS DESTRUCTION (WMD)

As we said earlier, chemical, biological, radiological, and nuclear weapons are now all classed as weapons of mass destruction. Recent events in the world indicate several nations with WMDs have ties or suspected ties to terrorist organizations so the threat of an attack on North America is very real.

In the event of a threat against North America with WMD, there are officials from all levels of government responsible for employing and equipping WMD terrorism response units to manage the situation. The information in this book may be helpful, but it is critical the general public stays calm and listens to local and federal officials for specific instructions.

You may want to review APPENDIX C "County Emergency Preparedness Terrorism Emergency Operations Outline" contributed by South Carolina's Charleston County Emergency Preparedness Department.

What are YOU gonna do about… A THUNDERSTORM?

Thunderstorms are very common… in fact, at any given moment, nearly 1,800 thunderstorms can be in progress over the face of the earth! The U.S. usually averages about 100,000 thunderstorms each year.

Lightning always comes with a thunderstorm since that is what causes the thunder. If you have ever heard someone say lightning never strikes the same place twice… WRONG… it can! In fact, lightning OFTEN strikes the same place several times during one storm. Lightning actually comes from the ground up into the air and back down - we just see it as it comes down so it looks like it's coming from the clouds.

Severe thunderstorms can also bring heavy rains, flooding, hail, strong winds, tornadoes and microbursts (a sudden vertical drop of air).

BEFORE A THUNDERSTORM:

Prepare - Review WIND, FLOOD, and LIGHTNING MITIGATION at beginning of this Section.

Learn the buzzwords - Learn the terms / words used with thunderstorms...

- **Severe Thunderstorm Watch** - tells you when and where severe thunderstorms are possible
- **Severe Thunderstorm Warning** - severe thunderstorms are have been spotted or are occurring

Watch for lightning - If you hear thunder, you're close enough to be struck by lightning - take cover as quickly as possible.

Unplug it - Unplug appliances if possible - even ones on a surge protector and it's best to move plugs away from outlets.

DURING A THUDERSTORM:

Listen - Keep a battery-operated radio near by for local reports on storm (especially severe storms which could cause tornadoes!)

IF INDOORS - Stay inside until the storm passes.

- Don't shower - sounds weird, but it's best to avoid taking a bath or shower since water can carry an electrical charge if lightning strikes near your home

- Telephone - best not to use since phone lines can conduct electricity (could shock you).

IF OUTDOORS - Try to get to safe shelter quickly.

- Move away from tall things (trees, towers, fences, telephone or power lines) and metal things (umbrellas, motorcycles or bicycles, wire fences, etc) since they all attract lightning.
- If surrounded by trees, take shelter under the shorter trees.
- Get to a low lying area (like a ditch or a valley) but watch out for flash floods.
- **Be small** - make yourself a small target by crouching down and put your hands on your knees (and don't lie flat on the ground since that makes you a bigger target!)

IF IN A BOAT - Get to land and to shelter quickly! Water is extremely dangerous when there's lightning!

IF IN A VEHICLE - Keep windows closed and stay out of a convertible, if possible (mainly because the top is usually fabric and that could make YOU the highest target if lightning strikes).

Hairy sign - If you feel your hair stand on end and feel tingly (which means lightning is about to strike)… crouch down and bend forward putting hands on your knees (be small)! Don't lie flat on ground… makes a bigger target!

If someone is struck by lightning:

- Victim does not carry electrical charge and CAN be touched.
- Call 9-1-1 or your local EMS (emergency) telephone number.
- Victim will have 2 wounds - an entrance and an exit burn and give first aid, if needed. *(see BURNS [Electrical] in Section 3)*

After a Thunderstorm:

Things to avoid:

- **flooded areas** – stay away from flood waters since it may be contaminated by oil, gasoline or raw sewage or electrically charged from underground or downed power lines or lightning – wait for authorities to approve returning to flooded areas
- **moving water** – 6 inches (15 cm) of moving water can knock you off your feet and 2 ft (.6 m) of moving water can float a car
- **storm-damaged areas**
- **downed power lines**

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about… A TORNADO?

The U.S. has more tornadoes than anywhere else in the world (averaging about 1,000 per year), with sightings in all 50 states. Canada is # 2 in volume of tornadoes (averaging about 80 per year) with several high risk areas mostly in central provinces.

Most injuries or deaths caused by tornadoes are from collapsing buildings, flying objects, or trying to outrun a twister in a vehicle. Tornadoes can also produce violent winds, hail, lightning, rain and flooding.

Dr. T. Fujita developed a damage scale **(Fujita Scale or F-scale)** based on wind speeds and damage potential. *(Note, wind speeds are estimates and not scientifically verified, but this is the most common rating method per NOAA.)*

Scale	Wind Estimate	Typical Damage *(per NOAA Storm Prediction Ctr)*
F0	< 73 mph < 117 km/h	**Light**: Some damage to chimneys, signs and vegetation.
F1	73-112 mph 117-180 km/h	**Moderate**: Peels surface off roofs; blows most mobile homes and moving autos around, etc.
F2	113-157 mph 181-253 km/h	**Considerable**: Roofs & mobile homes destroyed; trees snap; light-object missiles generated, etc.
F3	158-206 mph 254-331 km/h	**Severe**: Roofs & walls ripped off sturdy homes; trees uprooted; heavy cars lifted and thrown, etc.
F4	207-260 mph 333-418 km/h	**Devastating**: Most homes leveled; some pieces blown; cars thrown and large missiles generated.
F5	261-318 mph 420-511 km/h	**Incredible**: All homes leveled and swept away; car-sized missiles fly thru air over 100 metres (109 yards); trees debarked & other weird stuff.

Did you know…

… the force of a tornado can strip asphalt chunks off roads, rip clothes off people, and pluck feathers off chickens?!

BEFORE A TORNADO:

Prepare - Review WIND, FLOOD, and LIGHTNING MITIGATION at beginning of this Section.

Learn the buzzwords - Learn the terms / words used with tornado threats...

- **Tornado watch** - a tornado is possible so listen to TV or radio for updates

- **Tornado warning** - a tornado has been sighted so take shelter quickly and keep a battery-operated radio with you for updates

Learn risks - Ask the local emergency management office about threats in your area, what the warning signals are, and what to do when you hear them.

Where am I? - Make sure everyone knows what county or area you live in and listen for that name on radio updates.

Get tuned in - Make sure you have a battery-operated radio (with spare batteries) for weather forecasts and updates. (Some radios like Environment Canada's Weatheradio and NOAA's Weather Radio have a tone-alert feature that automatically alerts you when a Watch or Warning has been issued.)

Be ready to evacuate - Listen to local authorities and if told to leave - do it! *(see EVACUATION)*

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Learn to shut off - Know where and how to shut off electricity, gas and water at main switches and valves -- ask local utilities for instructions.

Where do I go? - Know locations of shelters where you spend time (schools, nursing homes, office, etc.) The best place is underground (like a basement, a safe room, or storm cellar) or find a hallway, bathroom, or closet in middle of building on the lowest floor.

Do drills - Practice going to shelter with your family and "duck and cover" (use your hands and arms to protect head and stay down low).

Put it on film - Either videotape or take pictures of your home and personal belongings and store them in a safe place (like a fireproof box or a safety deposit box) along with important papers.

During a Tornado Watch or Warning:

Review above tips and...

Listen - Keep up with local news reports tracking the twister or conditions using a battery-operated radio.

Watch & listen - Some danger signs of a tornado include dark green-ish sky, clouds moving to form a funnel, large hail, or loud roar (like a freight train).

Be ready to evacuate - Keep listening to authorities and leave if told to do so.

During a Tornado:

Listen - Use a battery-operated radio to hear reports tracking the twister.

Take cover - If you hear or see a tornado coming take cover immediately!

IF IN A TRAILER OR MOBILE HOME – GET OUT!!!

- Get to a stronger shelter… or …
- Stay low to ground in a dry ditch and cover head with hands.
- If you hear or see water in the ditch, move quickly to a drier spot (in case lightning strikes nearby).

IF INDOORS - Get to a safe place right away - and avoid windows!!

- In house or small building - go to basement, storm cellar or middle of building on lowest floor (a bathroom, closet or hallway). Get under something sturdy or put mattress or covers over you for protection and stay put until danger has passed!
- In a school, nursing home, hospital, factory or shopping center - go to designated shelter areas (or interior hallways on lowest floor) -- stay away from open areas.
- In a high-rise building - go to a small, interior room or hallway on lowest floor possible and avoid windows.

IF OUTDOORS - Try to take shelter in a basement or sturdy building! Or lie in a dry ditch with hands covering your head, but watch and listen for flooding and be aware you're a bigger target for lightning. (And if you hear or see water, move since it can carry lightning's electrical charge!)

IF IN A VEHICLE - GET OUT and take shelter in a building or lie flat in a ditch with hands covering head (but be aware you're a bigger target for lightning when lying flat & listen for flooding!) DO NOT try to out-drive a tornado! You never know which direction one will go and it moves too fast.

After a Tornado:

Watch out - Look for broken glass and downed power lines.

Injured people - Do not try to move injured people unless they are in danger and call for help immediately. *(see TIPS ON BASIC FIRST AID)*

Don't go there - Stay out of damaged buildings or homes until OK'd to enter.

What to wear - Use sturdy work boots and gloves.

Recovery tips - See TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about… A Tsunami?

A tsunami [soo-nah´-mee] is a series of huge, destructive waves caused by an undersea disturbance from an earthquake, volcano, landslide, or even a meteorite. As the waves approach the shallow coastal waters, they appear normal and the speed decreases. Then, as the tsunami nears the coastline, it turns into a gigantic, forceful wall of water that smashes into the shore with speeds exceeding 600 miles per hour (965 km/h)! Usually tsunamis are about 20 feet (6 m) high but extreme ones can get as high as 100 feet (30 m)!

A tsunami is a series of waves and the first wave may not be the largest one, plus the danger can last for many hours after the first wave hits. During the past 100 years, more than 200 tsunamis have been recorded in the Pacific Ocean due to earthquakes and Japan has suffered a majority of them.

Did you know…

… a tsunami is not a tidal wave - it has nothing to do with the tide?!

… another name used to describe a tsunami is "harbor wave" - "tsu" means harbor and "nami" means wave in Japanese?!

… sometimes the ocean floor is exposed near the shore since a tsunami can cause the water to recede or move back before slamming in to shore?!

… boats, rocks and other debris can be moved inland hundreds of feet with power that can destroy everything in its' path?!

… tsunamis can travel up streams and rivers that lead to ocean?!

Before a Tsunami:

Prepare - Review WIND and FLOOD MITIGATION at beginning of this Section.

Learn the buzzwords - Learn the words used by both the West Coast / Alaska Tsunami Warning Center (WC/ATWC - for AK, BC, CA, OR, and WA) and the Pacific Tsunami Warning Center (PTWC - for international authorities, HI and all U.S. territories within Pacific basin) for tsunami threats...

- **Advisory** - an earthquake has occurred in the Pacific basin which might generate a tsunami
- **Watch** - a tsunami was or may have been generated, but is at least 2 hours travel time from Watch area
- **Warning** - a tsunami was or may have been generated and could cause damage to Warning area - should evacuate

Learn risks - If new to area, call local emergency management office about tsunami threat and learn what warning signals are and what to do when you hear them.

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**.

Listen - Make sure you have a battery-operated radio (with spare batteries) for weather forecasts and updates. (Radios like Environment Canada's Weatheradio and NOAA's Weather Radio have a tone-alert feature that automatically alerts you when a Watch or Warning has been issued.)

Water signs - If near water or shore, watch for a noticeable rise or fall in the normal depth of coastal water - that's advance warning of a tsunami so move to higher ground.

Feeling shaky...? - If you feel an earthquake in the Pacific Coast area (from Alaska down to Baja), listen to the radio for tsunami warnings.

Is that it...? - Don't be fooled by the size of one wave - more will follow and they could get bigger … and a small tsunami at one beach can be a giant wave a few miles away!

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Tsunami:

Leave - If you are told to evacuate, DO IT! Remember - a tsunami is a series of waves - the first one may be small but who knows what the rest will bring! Grab your **Disaster Supplies Kit** and GO!

IF ON OR NEAR SHORE - Get off the shore and get to higher ground quickly! Stay away from rivers and streams that lead to the ocean since tsunamis can go up them too. You cannot outrun a tsunami ... if you see the wave it's too late!

IF ON A BOAT - It depends where you are … either get to land or go further out to sea!

- In port - You may not have time to get out of port or harbor and out to sea - check with authorities to see what you should do (smaller boats may want to dock and get to land quickly).
- In open ocean - DO NOT return to port if a tsunami warning has been issued since the wave action is barely noticeable in the open ocean! Stay out in open sea or ocean until authorities advise danger has passed.

Don't go there - Don't try to go down to the shoreline to watch and don't be fooled by size of one wave - more will follow and they could get bigger so continue listening to radio and TV.

After a Tsunami:

Listen - Whether on land or at sea, local authorities will advise when it is safe to return to the area -- keep listening to radio and TV updates.

Watch out - Look for downed power lines, flooded areas and other damage caused by the waves.

Don't go in there - Try to stay out of buildings or homes that are damaged until it is safe to enter and wear sturdy work boots and gloves when working in the rubble.

Strange critters – Be aware that the waves may bring in many critters from the ocean (marine life) so watch out for pinchers and stingers!

RED or GREEN sign in window – After a disaster, Volunteers and Emergency Service personnel may go door-to-door to check on people. By placing a sign in your window that faces the street near the door, you can let them know if you need them to STOP HERE or MOVE ON.

Either use a piece of RED or GREEN construction paper or draw a big RED or GREEN "X" (using a crayon or marker) on a piece of paper and tape it in the window.

- RED means STOP HERE!
- GREEN means EVERYTHING IS OKAY…MOVE ON!
- Nothing in the window would also mean STOP HERE!

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section.

What are YOU gonna do about… A Volcanic Eruption?

A volcano is a mountain that opens downward to a reservoir of molten rock (like a huge pool of melted rocks) below the earth's surface. Unlike mountains, which are pushed up from the earth's crust, volcanoes are formed by their buildup of lava, ash flows, and airborne ash and dust. When pressure from gases and the molten rock becomes strong enough to cause an explosion, it erupts and starts to spew gases and rocks through the opening.

Volcanic eruptions can hurl hot rocks (sometimes called **tephra**) for at least 20 miles (32 km) and cause sideways blasts, lava flows, hot ash flows, avalanches, landslides and mudflows (also called **lahars**). They can also cause earthquakes, thunderstorms, flash floods, wildfires, and tsunamis. Sometimes volcanic eruptions can drive people from their homes forever.

Fresh volcanic ash is not like soft ash in a fireplace. Volcanic ash is made of crushed or powdery rocks, crystals from different types of minerals, and glass fragments that are extremely small like dust. But it is hard, gritty, smelly, sometimes corrosive or acidic (means it can wear away or burn things) and does not dissolve in water.

The ash is hot near the volcano but is cool when it falls over great distances. Ashfall is very irritating to skin and eyes and the combination of ash and burning gas can cause lung irritation or damage to small infants, the elderly or people with breathing problems.

Did you know…

… more than 80 percent of the Earth's surface above and below sea level was formed by volcanic eruptions?!

… there are more than 850 active volcanoes around the world and more than two-thirds of them are part of the "Ring of Fire" (a region that encircles the Pacific Ocean)?!

… volcanic eruptions can impact our global climate since they release gases like sulfur and carbon dioxide into the earth's atmosphere?!

… the primary danger zone around a volcano covers about a 20-mile (32 km) radius?!

… floods, airborne ash or dangerous fumes can spread 100 miles (160 km) or more?!

… a **pyroclastic** flow is an avalanche of ground-hugging hot rock, ash and gas that races down the slope of a volcano at speeds of 60 mph (97 km/h) with temperatures of nearly 1,300 degrees Fahrenheit (704 degrees Celsius)?!

… Alaska has had over 40 active volcanoes?!

Before a Volcanic Eruption:

Prepare - Review all MITIGATION tips at beginning of this Section. Also try to cover and protect machinery, electronic devices, downspouts, etc. from ashfall. Learn more by visiting the USGS Cascades Volcano Observatory Hazards Safety page at http://vulcan.wr.usgs.gov/Hazards/Safety

Learn alert levels - Ask local emergency management office which volcano warnings or alert levels are used locally since they vary depending on where you live (can be alert levels, status levels, condition levels or color codes).

Make a plan - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**. (Note: Put in goggles or safety glasses and dust masks for each family member to protect eyes and lungs from ash.)

Okay to go? - Don't go to an active volcano site unless officials say it's okay.

Be ready to evacuate - Listen to local authorities and leave if you are told to evacuate. *(see EVACUATION)*

During a Volcanic Eruption:

Listen - Do what local authorities say, especially if they tell you to leave!

Leave - If you are told to evacuate, DO IT! Don't think you are safe to stay at home and watch the eruption… the blast can go for many, many miles and can cause wildfires and many other hazards!

Watch out - Eruptions cause many other disasters:

- **flying rocks** - hurled for miles at extremely fast speeds!
- **mudflows, landslides or lahars** - they move faster than you can walk or run
- **lava flows** - burning liquid rock and nothing can stop it
- **gases and ash** - try to stay upwind since winds will carry these -- they are very harmful to your lungs
- **fires** - hot rocks and hot lava will cause buildings and forests to burn

IF INDOORS - Stay in, but be aware of ash, rocks, mudflows or lava!

- Close all windows, doors, vents and dampers and turn off A/C and fans to keep ash fall out.
- Put damp towels under doorways and drafty windows.
- Bring pets inside (if time - move livestock into closed shelters).
- Listen for creaking on your rooftop (in case ashfall gets heavy -- could cause it to collapse!)

IF OUTDOORS - Try to get indoors, if not…

- Stay upwind so ash and gases are blown away from you.
- Watch for falling rocks and, if you get caught in a rockfall, roll into a ball to protect your head!
- Get to higher ground - avoid low-lying areas since poisonous gases collect there and flash floods could happen.
- Use dust-mask or damp cloth over face to help breathing, wear long-sleeved shirts and pants, and use goggles or safety glasses to protect your eyes.
- Ashfall can block out sunlight and may cause lightning.

IF IN A VEHICLE - Avoid driving unless absolutely required.

- Slow down and keep speed at 35 mph (56 km/h) or slower, mainly because of thick dust and low visibility.
- Shut off engine and park in garage, if possible (driving stirs up ash that can clog motor and damage moving engine parts).
- Look upstream before crossing a bridge in case a mudflow or landslide is coming.

After a Volcanic Eruption:

Listen - Local authorities will say when it's safe to return to area (especially if you had to evacuate) and give other updates when available.

Water - Check with local authorities before using water, even if eruption was just ash fall (gases and ash can contaminate water reserves). Don't wash ash into drainpipes, sewers or storm drains since wet ash can wear away metal.

What to wear - If you must be around ash fall, you should wear long sleeve shirts, pants, sturdy boots or shoes, gloves and keep your mouth and nose covered with a dust-mask or damp cloth.

Ash - Dampen ash before sweeping or shoveling buildup so it's easier to remove and won't fly back up in the air as much - but be careful since wet ash is slippery. Wear protective clothing and dust mask too.

Protect - Cover and protect machinery and electronic devices like computers.

Dust city - Realize ash can disrupt lives of people and critters for months.

Recovery tips - Review TIPS ON RECOVERING FROM A DISASTER at end of this Section. Also visit the USGS Cascades Volcano Observatory Hazards Safety page at http://vulcan.wr.usgs.gov/Hazards/Safety

What are YOU gonna do about…
Winter Storms & Extreme Cold?

Winter storms can last for many days and include high winds, freezing rain, sleet or hail, heavy snowfall and extreme cold. These types of winter storms can shut down a city or area mainly due to blocked roads and downed power lines. People can be stranded in their car or trapped at home for hours or days, but there are many other hazards that come with these storms.

The leading cause of death during winter storms is automobile or other transportation accidents and the second leading cause of death is heart attacks. Hypothermia (or freezing to death) is very common with the elderly who sometimes die inside their homes because it is so cold.

The best way to protect yourself from a winter disaster is to plan ahead before the cold weather begins. Take advantage of spring sales when winter items are cheaper so you are ready for next winter!

Before a Winter Storm:

Prepare - Review WIND, FLOOD, and WINTER STORM MITIGATION at beginning of this Section.

Learn the buzzwords - Learn terms / words used with winter conditions...

- **Freezing rain** - rain that freezes when it hits the ground, creating a coating of ice on roads and walkways
- **Hail** - rain that turns to ice while suspended and tossed in the air from violent updrafts in a thunderstorm
- **Sleet** - rain that turns to ice pellets before reaching ground (which can cause roads to freeze and become slippery)
- **Winter Weather Advisory** - cold, ice and snow expected
- **Winter Storm Watch** - severe winter weather such as heavy snow or ice is possible within a day or two
- **Winter Storm Warning** - severe winter conditions have begun or are about to begin
- **Blizzard Warning** - heavy snow and strong winds producing blinding snow (near zero visibility) and life-threatening wind chills for 3 hours or longer
- **Frost/Freeze Warning** - below freezing temperatures expected

Be prepared - Review Section 1 to develop a **Family Emergency Plan** and **Disaster Supplies Kit**, and add the following at home for winter storms:

- **rock salt** - good for melting ice on walkways

- **sand or kitty litter** - to improve traction
- **emergency heating equipment and fuel** - good to have backup in case power is cut off

  fireplace - gas or wood burning stove or fireplace
  generator – gas or diesel models available
  kerosene heaters – ask your Fire Department if they are legal in your community and ask about safety tips in storing fuel!
  charcoal - NEVER use charcoal indoors since fumes are deadly in contained room -- fine for outdoor use!!
- **extra wood** - keep a good supply in a dry area
- **extra blankets** – either regular blankets or emergency blankets (about the size of a wallet)

During a Winter Storm:

Listen - Get updates from radio and TV weather reports.

What to wear - Dress for the season…

- **layer** - much better to wear several layers of loose-fitting, light-weight, warm clothing than one layer of heavy clothing (outside garment should be waterproof)
- **mittens** - mittens are warmer than gloves
- **hat** - most body heat is lost through the top of your head
- **scarf** - cover your mouth with a scarf or wrap to protect your lungs from cold air

Don't overdo it - Be careful when shoveling snow or working outside since cold can put added strain on heart and cause a heart attack (even in children!)

Carbon monoxide - Learn how to protect your home from winter heating dangers by visiting the Center for Disease Control's Carbon Monoxide web site at www.cdc.gov/nceh/airpollution/carbonmonoxide

Watch for signs - playing or working out in the snow can cause exposure so look for signs of…

- **frostbite** - loss of feeling in your fingers, toes, nose or ear lobes or they turn really pale
- **hypothermia** - start shivering a lot, slow speech, stumbling, or feel very tired

If signs of either one ... get inside quickly and get medical help *(see COLD-RELATED ILLNESSES in Section 3)*

Winter Driving Tips

Driving - If you must travel, consider public transportation. Best to travel during the day, don't travel alone, and tell someone where you're going. Stay on main roads and avoid taking back roads.

Winterize car - Make sure you have plenty of antifreeze and snow tires (or chains or cables). Keep gas tank as full as possible during cold weather.

Winter Kit - Carry a "winter" car kit in trunk *(see CAR KIT in Section 1)* and also throw in…

- **warm things** – mittens, hat, emergency blanket, sweater, waterproof jacket or coat
- **cold weather items** - windshield scraper, road salt, sand
- **emergency items** - brightly colored cloth or distress flag, booster cables, emergency flares, tow chain or rope, shovel
- **miscellaneous** - (food, water, etc. mentioned in CAR KIT)

Stranded - If you get trapped in your car by a blizzard or break down…

- **get off the road** - if you can drive, pull the car off main road onto shoulder
- **give a sign** - turn on hazard lights and tie a bright cloth or distress flag on antenna, door handle or hang out driver side window (keep above snow so it draws attention)
- **stay in car** - stay inside until help arrives (your CAR KIT will provide food, water and comforts if you planned ahead)
- **start your car** - turn on car's engine and heater for about 10 minutes each hour (open window slightly for ventilation so you don't get carbon monoxide poisoning)
- **light at night** - turn on inside light at night so crews or rescuers can see you
- **if you walk** - if you walk away from car, make sure you can see building or shelter (no more than 100 yards or 10 m)
- **exercise** - DO NOT overdo it, but light exercises can help keep you warm
- **sleeping** - if others in car, take turns sleeping so someone can watch for rescue crews
- **exhaust pipe** - check exhaust pipe now and then and clear out any snow buildup

After a Winter Storm:

Restock - After the storm clears, stock up on items you used so you're ready for the next one!

Tips on Recovering From a Disaster...

Tips on Recovering From A Disaster

Unless you've been in a disaster before, it is hard to imagine how you will handle the situation. Coping with the human suffering and confusion of a disaster requires a certain inner strength. Disasters can cause you to lose a loved one, neighbor or friend or cause you to lose your home, property and personal items. The emotional effects of loss and disruption can show up right away or may appear weeks or months later.

We are going to briefly cover "emotional" recovery tips then cover some "general" recovery tips on what to do AFTER a disaster. Remember -- people *can* and *do* recover from all types of disasters, even the most extreme ones, and you can return to a normal life.

Emotional Recovery Tips – Handling Emotions

Since disasters usually happen quickly and without warning, they can be very scary for both adults and children. They also may cause you to leave your home and your daily routine and deal with many different emotions, but realize that a lot of this is normal human behavior. It is very important that you understand no matter what the loss is… there is a natural grieving process and every person will handle that process differently.

Some Normal Reactions to Disasters

Right after disaster – shock, fear, disbelief, has hard time making decisions, refuses to leave home or area, won't find help or help others

Days, weeks or months after disaster – anger or moodiness, depression, loss of weight or change in appetite, nightmares, crying for "no reason", isolation, guilt, anxiety, domestic violence

Additional reactions by children - thumb sucking, bed-wetting, clinging to parent(s) or guardian, won't go to bed or school, tantrums (crying or screaming), problems at school

Please note: If any of your disaster reactions seem to last for quite some time, please seek professional counseling to help deal with the problem. There is nothing wrong with asking for help in recovering emotionally!

Tips for Adults & Kids

Deal with it - Recognize your own feelings so you can deal with them properly and responsibly.

TALK - Talking to others helps relieve stress and helps you realize you are not alone… other victims are struggling with the same emotions… including

your own family! And don't leave out the little ones … let them talk about their feelings and share your feelings with them.

Accept help - Realize that the people who are trying to help you want to help you so please don't shut them out or turn them away!

Time out - Whenever possible, take some time off and do something you enjoy to help relieve stress… and do something fun with the whole family like a hike, a picnic, or play a game.

Rest - Listen to your body and get as much rest as possible. Stress can run you down so take care of yourself and your family members.

Slow down - Don't feel like you have to do everything at once and pace yourself with a realistic schedule.

Stay healthy - Make sure everyone cleans up with soap and clean water after working in debris. Also, drink lots of clean water and eat healthy meals to keep up your strength. If you packed vitamins and herbs in your **Disaster Supplies Kit**, take them.

Work out - Physical activity - like running or walking - is good for releasing stress or pent-up energy.

Hug - A hug or a gentle touch (holding a hand or an arm) is very helpful during stressful times.

They're watching you - Kids look to adults during a disaster so your reactions will impact the kids (meaning if you act alarmed or worried – they'll be scared, if you cry – they cry, etc.)

Stick together - Keep the family together as much as possible and include kids in discussions and decisions whenever possible.

Draw a picture - Ask your kids to draw a picture of the disaster to help you understand how he or she views what happened.

Explain - Calmly tell your family what you know about the disaster using facts and words they can understand and tell everyone what will happen next so they know what to expect.

Reassurance - Let your kids and family know that they are safe and repeat this as often as necessary to help them regain their confidence.

Praise - Recognizing good behavior and praise for doing certain things (even the littlest of things) will help boost morale.

Watch your temper - Stress will make tempers rise but don't take out your anger on others, especially kids. Be patient and control your emotions.

Let kids help - Including children in small chores during recovery and clean up processes will help them feel like they are part of the team and give them more confidence.

Let others know - Work with your kids' teachers, day-care staff, babysitters and others who may not understand how the disaster has affected them.

General Recovery Tips - AFTER a Disaster

Returning to a Damaged Home:

Listen - Keep a battery-operated radio with you for any emergency updates.

What to wear – Use sturdy work boots and gloves.

Check outside first - Before you go inside, walk around outside to check for loose power lines, gas leaks, and structural damage.

Call a professional - If you have any doubts about the safety of your home, contact a professional inspector.

Don't go in there - If your home was damaged by fire, do NOT enter until authorities say it is safe (also don't enter home if flood waters remain around the building).

Use a flashlight - There may be gas or other flammable materials in the area so use a battery-operated flashlight (do not use oil, gas lanterns, candles or torches and don't smoke!)

Watch out - Look for critters, especially snakes (flooding will carry them) and use a stick to poke through debris.

Things to check - Some things you want to do first…

- Check for cracks in the roof, foundation and chimneys.
- Watch out for loose boards and slippery floors.
- Check for gas leaks (either by smell or listen for a hissing or blowing sound) ...
  - Start with the hot water heater.
  - Turn off the main gas valve from outside.
  - Call the gas company.
- Check the electrical system (watch for sparks, broken wires or the smell of hot insulation) ...
  - Turn off electricity at main fuse box or circuit breaker.
  - DO NOT touch the fuse box, circuit breaker or wires if in water or if you're wet!

- Check appliances after turning off electricity at main fuse and, if wet, unplug and let them dry out. Call a professional to check them before using.
- Check the water and sewage system and, if pipes are damaged, turn off main water valve.
- Clean up any spilled medicines, bleaches, gasoline, etc.
- Open cabinets carefully since things may fall out.
- Look for valuable items (jewelry, etc.) and protect them.
- Check house for mold. *(see AIR QUALITY MITIGATION)*
- Try to patch up holes, windows and doors to protect home from further damage.
- Clean and disinfect everything that got wet (bleach is best) since mud left behind by floodwaters can contain sewage and chemicals.
- If basement is flooded, pump it out slowly (about 1/3 of the water per day) to avoid damage since the walls may collapse if surrounding ground is still waterlogged. *(see page 62)*
- Check with local authorities about water since it could be contaminated! Wells should be pumped out and the water tested before using, too.
- Throw out food, makeup and medicines that may have been exposed to flood waters and check refrigerated foods to see if they are spoiled. If frozen foods have ice crystals in them then okay to refreeze.
- Call your insurance agent, take pictures of damage, and keep ALL receipts on cleaning and repairs.

Getting Help: Disaster Assistance

Listen - Local TV and radio will announce where to get emergency housing, food, first aid, clothing and financial assistance after a disaster.

Help finding family - The Red Cross maintains a database to help people find family, but please don't call office in disaster area since they'll be swamped!

Agencies that help - The Red Cross is often stationed right at the scene of a disaster to help people with immediate medical, food, and housing needs. Some other sources of help include the Salvation Army, church groups and synagogues, and various other Social Service agencies from local, state and provincial governments.

President declares a "Major Disaster" (in U.S.) - In severe U.S. disasters, the government (FEMA) steps in and provides people with ...

- Temporary housing
- Counseling

- Low interest loans and grants
- Businesses and farms are eligible for aid through FEMA

FEMA's Disaster Recovery Centers - FEMA will set up DRCs at local schools and municipal buildings to manually process applications and where people can meet face-to-face with agencies to ...

- Discuss their disaster-related needs.
- Get information about disaster assistance programs.
- Teleregister for assistance.
- Learn about measures for rebuilding that can eliminate or reduce risk of future loss (mitigation tips).
- Learn how to complete Small Business Administration (SBA) loan application (same form used to qualify all individuals for low cost loans or grants, including repair or replacement of damaged homes & furnishings).
- Request status of their Disaster Housing Application.

Or ... people can apply for assistance with DRC over the phone by calling 1-800-621-FEMA (3362).

I lost my job (in U.S.) - People who lose their job due to a disaster may apply for weekly benefits using Disaster Unemployment Assistance (DUA). You can call 1-800-621-FEMA (TTY: 1-800-462-7585) or your local unemployment office for registration information.

Legal help (in U.S.) - Local members of the American Bar Association Young Lawyers Division offer free legal counseling to low-income individuals after the President declares a major disaster. FEMA can provide more information at their DRCs or call 1-800-621-FEMA (TTY: 1-800-462-7585).

Canadian disaster - In the event of a large-scale disaster in Canada, the provincial or territorial government would pay out money to individuals and communities in accordance with its provincial disaster assistance program.

(Federal assistance - Disaster Financial Assistance Arrangements [DFAA] is paid to the province or territory... not to individuals and communities as FEMA does in the U.S.!)

Recovering financially - The American Red Cross and FEMA developed the following list to help you minimize the financial impact of a disaster:

- **First things first** - 1) remove valuables only if your residence is safe to enter, 2) try to make temporary repairs to limit further damage, and 3) notify your insurance company immediately!
- **Conduct inventory** - make sure you get paid for what you lost
- **Reconstruct lost records** - use catalogs, want ads, Blue Books, court records, request old tax forms from IRS, escrow papers, etc. to help determine value of lost possessions

- **Notify creditors and employers** - let people you do business with know what has happened
- **File insurance claim** - get all policy numbers; find out how they are processing claims; identify your property with a sign; file claims promptly, work with adjusters, etc.
- **Obtain loans and grants** - local media will announce options available for emergency financial assistance
- **Avoid contractor rip-offs** - get several estimates; don't rush into anything; ask for proof of licenses, permits and insurance; get contract in writing; never prepay; get signed release of lien; check out contractors with local Better Business Bureau, etc.
- **Reduce your tax bite** - you may be eligible for tax refunds or deductions but know they can be very complex so you may want to ask an expert for advice

** Note: A detailed brochure called "Recovering Financially After a Disaster" prepared by the National Endowment for Financial Education®, the Red Cross, and FEMA is available on the Red Cross's web site or may be at your local Red Cross chapter. (see Section 4)*

Mitigation (Reducing the Impact for the Next Time)

The last thing you want to think about after a disaster is "what if it happens again"! Before you spend a lot of time and money repairing your home after a disaster, find ways to avoid or reduce the impact of the next disaster.

FEMA recommends the following mitigation tips AFTER A DISASTER:

- Ask local building department about agencies that purchase property in areas that have been flooded. You may be able to sell your property to a government agency and move to another location.

- Determine how to rebuild your home to handle the shaking of an earthquake or high winds. Ask local government, hardware dealer, or private home inspector for technical advice.

- Consider options for flood-proofing your home. Determine if your home can be elevated to avoid future flood damage.

- Make sure all construction complies with local building codes that pertain to seismic, flood, fire and wind hazards. Make sure roof is firmly secured to the main frame of the house. Make sure contractors know and follow the code and construction is inspected by a local building inspector.

And please review **ALL** Mitigation tips at the beginning of this Section.

Tips on Shelter Living During or After an Emergency

Taking shelter during a disaster could mean you have to be somewhere for several hours or possibly several days or weeks! It could be as simple as going to a basement during a tornado warning or staying home without electricity or water for several days during a major storm.

In many emergencies, the Red Cross and other organizations set up public shelters in schools, city or county buildings and churches. While they often provide water, food, medicine, and basic sanitary facilities, you should plan to have your own supplies - especially water.

Whether your shelter is at home or in a mass care facility use the following tips while staying there during or after an emergency:

Don't leave - Stay in your shelter until local authorities say it's okay to leave. Realize that your stay in your shelter can range from a few hours to weeks ... or longer in some cases!

Take it outside - Restrict smoking to well-ventilated areas (outside if it's safe to go out) and make sure smoking materials are disposed of safely!

Behave - Living with many people in a confined space can be difficult and unpleasant but you must cooperate with shelter managers and others in the shelter.

24-hour watch - Take turns listening to radio updates and keep a 24-hour communications and safety watch going.

Toilet - Bathrooms may not be available so make sure you have a plan for human waste. *(see TIPS ON SANITATION OF HUMAN WASTE)*

Pets - Public shelters do not allow pets due to health reasons (unless it is a service animal assisting a disabled person) so you will have to make arrangements to keep them somewhere else. You can try the Humane Society or local Animal Shelter - if they are still functioning after a disaster.

Next we're going to cover some basic things to think about in the event you and your family are without power, running water, and/or functioning toilets during an emergency or disaster. We suggest you read over these topics and think about the things you might want to get in advance so you can be prepared for several days or longer.

Tips on Using Household Foods

Cooking in a Disaster Situation

When disaster strikes, you may not have electricity or gas for cooking. For emergency cooking you can use a charcoal grill, hibachi or propane camping unit or stove - but only do this OUTDOORS!

Never use charcoal in an enclosed environment since it causes deadly fumes!

You can also heat food with candle warmers or a can of sterno.

Canned food can be heated in the can, but remember to remove the paper label and open the can first! And be careful -- don't burn your hand since it may be hot!

If the electricity goes off, use Food wisely ...

First - Use perishable food and foods from the refrigerator … and limit opening the frig (don't stand and stare in it like most of us do!) The frig will keep foods cool for about 4 hours without power if left unopened. Dry ice or a block of ice can be placed in refrigerator if power is out more than 4 hours.

Second - Use foods from the freezer and, if possible, have a list of items in the freezer taped outside or at least know how things are organized inside to find stuff quickly. (Keeping door shut keeps cold in!) Foods in a well-filled, well-insulated freezer will not go bad until several days after power goes off. Usually there will be ice crystals in the center of food (which means it's still okay to eat or refreeze) for at least 3 days after a power failure.

Third - Use non-perishable foods and staples in your pantry and cabinets.

TIP FOR YOUR FREEZER:

Before a disaster strikes, line your indoor and/or outdoor freezer wall with jugs of frozen water. Save empty fruit juice bottles or plastic milk jugs and disinfect them with a small amount of regular scent household bleach. (Make sure to swish the bleach around good to clean the entire jug and handle!)

Rinse and let it air dry for an hour or so. Then fill with clean water - but don't fill bottle or jug completely since water will expand as it freezes and could push the cap off or crack the plastic over time.

Place bottle or jug in freezer and it can help keep food cold longer if you lose power, plus you'll have extra water once it melts! This also helps keep the freezer as full as possible which makes it more energy efficient.

Tips on Water Purification

Water is critical for survival. We can go days, even weeks, without food but we must have water to live. For example, an average man (154 pounds) can lose about 3 quarts/litres of water per day and an average woman (140 pounds) can lose over 2 litres - and this could increase depending on your weight and size, on the season, and the altitude.

Your body can lose precious water by sweating and breathing - whether you feel it or not – and, of course, by peeing. In fact, the color of your pee will tell you if you are getting dehydrated. When you drink enough water, your pee will be a light-colored or bright yellow, but when you are dehydrated it will be dark-colored and you'll pee in smaller amounts.

The average person should drink between 2 and 2 ½ quarts/litres of water per day. We suggest you plan on storing about one gallon (4 litres) per day per person to cover for drinking, cooking and personal hygiene - and don't forget water for your pets!

Did you know…

… some 6,000 children die every day from water-related disease?

… about 1.1 billion people (one-sixth of the world's population) don't have access to safe water?

Use any of the following methods to purify drinking water:

Boiling - Boil vigorously for 5-10 minutes. Boiling water kills most harmful bacteria and parasites. To improve the taste of boiled water pour it back and forth between two containers to add oxygen back into it.

Bleach - Add 10-20 drops of "regular" household bleach per gallon (about 4 litres) of water, mix well, and let stand for 30 minutes. A slight smell or taste of chlorine indicates water is good to drink. *(NOTE: Do NOT use scented bleaches, colorsafe bleaches, or bleaches with added cleaners!)*

Tablets - Use commercial purification tablets and follow instructions. Tablets are pretty inexpensive and found at most sporting goods stores and some drugstores.

Stabilized oxygen - Use 10 drops of stabilized oxygen per gallon / 4 litres of water to help prevent the growth of certain bacteria. (To store water for long periods of time use 20 drops per gallon/4 litres.)

Also, learn how to remove the water in the hot water heater and other water supplies in your home or office (like ice cubes or the toilet tank - not the toilet bowl and don't use it if chemicals are in the tank!)

Tips on Sanitation of Human Waste

In disaster situations, plumbing may not be usable, due to broken sewer lines, broken water lines, flooding, or freezing of the system. To avoid the spread of disease, it is critical that human waste be handled in a sanitary manner!

Did you know…

… one gram (0.035 oz) of human poop can contain 10 million viruses, 1 million bacteria, 1,000 parasite cysts, and 100 parasite eggs!?[6]

IF TOILET OKAY BUT LINES ARE NOT…

If water or sewer lines are damaged but the toilet is still intact, you should line the toilet bowl with a plastic bag to collect waste… but DO NOT flush the toilet!! After use, add a small amount of disinfectant to the bag, remove and seal bag (with a twist tie if reusing), and place bag in a tightly covered container away from people to reduce smell.

IF TOILET IS UNUSABLE…

If toilet is destroyed, a plastic bag in a bucket may be substituted. (Some companies make plastic buckets with snap-on lids.) After use, add a small amount of disinfectant to the bag, and seal or cover bucket.

DISINFECTANTS - easy and effective for home use in Sanitation of Human Waste. Choose one to store with your Disaster Supplies Kit:

Chlorine Bleach - If water is available, a solution of 1 part liquid household bleach to 10 parts water is best. DO NOT use dry bleach, which is caustic (can burn you, corrode or dissolve things) - is not safe for this kind of use.

Calcium hypochlorite - (e.g. HTH, etc.) Available in swimming pool supply or hardware stores and several large discount stores. It can be used in solution by mixing, then storing. Follow directions on the package.

Portable toilet chemicals - These come in both liquid and dry formulas and are available at recreational vehicle (RV) supply stores. Use according to package directions. These chemicals are designed especially for toilets that are not connected to sewer lines.

Powdered, chlorinated lime - Available at some building supply stores. It can be used dry and be sure to get chlorinated lime - *not* quick lime!

There are also several types of camping toilets and portable toilets available in camping stores and on the Internet that range from fairly low dollars to hundreds of dollars. Or get a small shovel so you can at least dig a hole or latrine outside like campers do.

Tips on Helping Others in Their Time of Need

A disaster really brings out the generosity of many people who want to help the victims. Unfortunately, sometimes this kindness overwhelms agencies that are trying to coordinate relief efforts so please review the following general guidelines defined by FEMA on helping others after a disaster.

- In addition to the people you care for on a daily basis, consider the needs of your neighbors and people with special needs.

- If you want to volunteer your services after a disaster, listen to local news reports for information about where volunteers are needed. Until volunteers are specifically requested, please stay away from disaster areas.

- If you are needed in a disaster area, bring your own food, water and emergency supplies. This is especially important in cases where a large area has been hit since these items may be in short supply.

- Do not drop off food, clothing or other items to a government agency or disaster relief organization unless a particular item has been requested. They usually don't have the resources to sort through donations and it is very costly to ship these bulk items.

- If you wish, give check or money order to a recognized disaster relief organization like the Red Cross. They can process funds, purchase what is needed and get it to the people who need it most. Your entire donation goes towards the disaster relief since these organizations raise money for overhead expenses through separate fund drives.

- If your company wants to donate emergency supplies, donate a quantity of a given item or class of items (such as nonperishable food) rather than a mix of different items. Also, find out where donation is going, how it's going to get there, who's going to unload it and how it will be distributed. Without good planning, much needed supplies will be left unused.

Tips for Volunteers and Disaster Workers

- FEMA offers excellent information for disaster workers and volunteers to help you recover emotionally and physically after helping with a disaster.
- FEMA also coordinates many counseling programs to help you adjust back to a normal life since the emotions and images can take weeks or months - even years - to heal.
- Please DO NOT hold these feelings and emotions inside since they can lead to emotional destruction of you and your loved ones through domestic violence, divorce, isolation, addiction, and/or suicide.
- Take advantage of programs and counselors offered by FEMA following a disaster. There is absolutely nothing wrong with asking for some help in recovering emotionally.